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Original Communications.

SOME REMARKS ON THE DIET OF CHILDHOOD.[1]

BY D. J. M. MILLER, M.D.,
Physician to the Episcopal Hospital, Philadelphia.

These remarks are confined to healthy children between the ages of three and twelve years. They are the result of personal observation, and if they differ somewhat from the advice usually given, it is because my experience has convinced me that the dietary about to be suggested is the one best suited to the wants of growing children. The aphorism of the Father of Medicine, "Experience is fallacious and judgment difficult," applies as well to food as to medicine; and as in the treatment of disease we often achieve similar results by entirely different measures, so in the matter of diet one system of feeding may succeed as well as another that is really no system at all, and is altogether contrary to commonly accepted views. The following principles should underlie any dietetic scheme for children:

1. It should be simple, wholesome, attractively prepared, and properly adapted to the needs of the particular child.

2. It should not be too restricted.

3. It should be varied and free from sameness.

If I felt inclined to criticize the diet lists

[1]Read at a meeting of the South Branch, Philadelphia County Medical Society, May 25, 1906.

for children recommended by some recognized authorities, it would be on the score of sameness and want of liberality. A dietary that prescribes the exact amount and limits the choice of food to be given, although the articles selected may be excellent in themselves, does not meet the requirements of many children, who will often pall at its narrowness and monotony, refuse to eat, and thereby suffer in their nutrition. Children have tastes and instincts as well as adults, and these must be respected, if we would nourish them satisfactorily. Quite often we see a child turn from some article of food wholesome enough in itself, and yet eat with avidity and digest perfectly another article not nearly so suitable as the first, thus exemplifying Pawlow's well-known experiment on "appetite-juice," that it is the things we like that we digest most readily.

It is the children of the well-to-do and the rich that are most liable to suffer from too careful a dietary. Too often are the offspring of this class pale and ill-nourished, although having an abundance of fresh air and other hygienic surroundings. This condition, I believe, is frequently due to too much care in selecting children's food, by denying them articles that they crave and withdrawing from them things that they like. The overcareful mother, also, who follows too closely some of the excellent guides written for her instruction, is apt to err in the same direction, and, through undue caution, restrict her children's food until their nutrition is seriously affected. I have known children to partake for weeks of such small quantities of a suitable dietary that their loss of weight was apparent to every one, yet have an immediate return of appetite and take on flesh when the bill of fare was changed and enlarged. It is manifestly absurd to insist upon bread, milk, and fruit for supper, if this regimen means no supper at all and restless sleep due to hunger alone. Nursery guides and similar books do not sufficiently insist that they are merely pointers of the way, and that their suggestions are always to be supplemented by brains and common sense. I feel convinced that the robustness and vigor so frequently seen in the children of mechanics and members of the poorer class (not the very poor) is, in part, due to their liberal and varied dietary. The stomach, as well as the soul, can be spoiled and pampered; the best stomach, and the one that we should endeavor to give to our children, is the one that can digest everything.

Hence I believe that children should be taught and encouraged to eat all wholesome articles of food; that they should be permitted to eat until satisfied; and that the amount of their food should not be measured by tablespoonfuls and ounces. This is eminently true in children with inherited tendencies, especially the offspring of the tuberculous and the neurotic; the latter being especially prone to fanciful and capricious appetites, and constituting a type of child quite common at the present day. Much tact and ingenuity, and many dietary resources, are often called for in overcoming the natural and acquired dislikes of children of this character.

Contrary to the opinion of many accepted authorities, it has seemed to me that the prolonged, and, as a consequence, often excessive, use of milk, to the exclusion of other food, is responsible for poor nutrition in some young children. One occasionally meets with children of three and four years of age whose principal food is still milk, or who, in addition to their regular meals, consume three or four pints of this food daily. In the former case the children are often pale and lack vigor and stamina; in the latter they are likely to suffer from attacks of indigestion, and are frequently pot-bellied from gaseous distention or gastric dilatation; and in both instances they may be obstinately constipated. Frequently have I seen obstinate constipation at once relieved by stopping or reducing the amount of milk, and the institution of a mixed diet. It is not necessary, as is so commonly the custom, to give a child of three, four, or even five years a bottle containing twelve ounces of milk at bedtime, when it has had its supper an hour or so previously. The use of the bottle is often unduly prolonged, simply because of the supposed comfort that it affords. A child should be taught to drink from a cup at twelve months, and should be weaned from the bottle at eighteen, or, at most, twenty-four months. The high position of milk as a food for children is not denied by the foregoing remarks. Milk should always form a part of the child's dietary, and should

be continued as late as possible; but it should be used in moderation, and not to the exclusion of other important foods.

When the age of three years is reached, it is presumed that the child is weaned from the bottle; that it has learned to chew thoroughly; and that it is taking, in addition to milk and broths, cereals, bread and butter, crackers, eggs, meat, plain vegetables, fruit, and simple desserts. In presenting a scheme for feeding during childhood, it seems best to divide that state into two periods, viz.: early childhood, up to six years of age; and from the latter period to the age of twelve.

DIET FROM THREE TO SIX YEARS OF AGE.

Breakfast (7.30 to 8 A.M.).—Cereals, with cream and salt; eggs, chops, steaks, stewed kidney, chicken, bacon (broiled or grilled), fresh fish (broiled only); milk, cocoa; bread and butter, zwieback; fruit.

The cereals should be varied, avoiding the same articles on successive days; otherwise the child may tire of them. A number of good cereals should be selected, and the gamut run upon these. Good, wholesome articles of this class are oatmeal, hominy-grits, Indian corn-meal, cream of wheat, and rice. I am no believer in the breakfast-food fad. Many of these preparations are a delusion and a snare, whose principal virtues exist in the advertisements of the exploiters; they are usually insufficiently cooked, are frequently deficient in nutritive properties, and are not suitable foods for children. All cereals should be well cooked. Oatmeal, hominy-grits, and Indian corn-meal should be cooked over night in a double boiler. Much indigestion results from a neglect of this method of preparation. Prepared foods, such as cream of wheat, should be cooked much longer than indicated on the packages, usually for an hour or more. Unless there is a special indication for their use, malted and predigested foods are not desirable. The same is true of those cereals composed largely of gluten, as they are apt to escape unchanged from the bowel. Some caution is necessary with oatmeal. Many children, particularly those with a tendency to acidity, eczema, and intestinal catarrh, cannot tolerate it. Cereals should be eaten without sugar, and with cream alone, or a mixture of cream and milk.

Eggs may be given boiled, shirred, scrambled, dropped, poached, steamed, and as omelettes—never fried. It is not wise to give eggs every day, as children quickly tire of them. They may be alternated with the meats above mentioned. Bacon, crisp and dry, is one of the most wholesome of foods, and, made very digestible by the method of preparation, can be given with advantage at three years; and kidneys, stewed, without eggs and wine, and finely minced, at four years. No reasonable objection can be urged to serving meat and chicken as well-prepared and simple hashes. It is not necessary to give meat every day; indeed, many children are better without it until the sixth year; but there is no valid objection to its use in moderate quantities three or four times a week, and it is better that the child eat meat than go without breakfast. In my judgment there is more danger from the excessive use of the farinaceous foods than from the use of meat, especially in those with a tendency to acidity. Children need more proteid than adults, and those in whose diet this food element is deficient are apt to be pale, sometimes obese, and often lacking in stamina.

Fruit, if possible, should always be eaten: orange, pineapple, and grape-fruit juice; grape-pulp (without seeds); strawberries; raspberries; fresh peaches. Blackberries had better be postponed until the age of five or six years, and raspberries until that of four years.

Hot cakes, fresh bread, muffins, and their ilk, as well as all fried foods, ham, sausage, highly seasoned dishes, condiments and spices, and salt fish, are not suitable foods for very young children; although an exception may be made in the case of crisp-fried Indian-meal mush and rice-cakes, for healthy children after the fourth year.

Luncheon.—Until the seventh year, and sometimes later, most children require a light luncheon at 10.30 or 11 A.M. With the dinner hour at noon this meal is, of course, unnecessary.

Suitable for the luncheon is milk, a tumbler or two, and any unsweetened biscuit or cracker. Sweetened crackers, especially the Graham wafer, are apt to induce flatulence and other signs of indigestion. The latter, for this reason, is excellent in constipation.

Dinner (1 or 2 P.M.).—Soup; mutton

or lamb, beef, chicken, or turkey (broiled or roasted); vegetables (two or three); bread and butter. Dessert: fruit, junket, custard, rice or bread pudding, blanc mange, corn-starch, sago and tapioca puddings, calf's-foot jelly (without wine), and ice-cream.

Plain meat or milk soups may be given, avoiding the rich and highly seasoned. Soup, if it takes away the appetite for the rest of the meal, should be omitted.

Meats should always be finely cut and rare, the dark meat of the chicken, because it is more digestible, being preferable to the white, in delicate children. Meat and chicken should be cooked as above indicated, but in cases in which the household economy demands it, may be boiled and stewed.

When vegetables are added to the dietary, the tender and more digestible varieties should at first be selected; then the coarser ones, as rapidly as the child manifests its capacity to digest them. Suitable vegetables are potatoes (baked, roasted, or mashed), sweet potatoes (roasted or baked), onions (stewed), spinach, peas, squash, asparagus-tips, cauliflower-blossoms (often a good substitute for potatoes, when that vegetable cannot be eaten), Lima- and string-beans, salsify, celery (stewed), tomatoes (stewed), rice, macaroni, and hominy. Many young children cannot digest spinach until the fourth or fifth year, the vegetable appearing unchanged in the stools; it should always be thoroughly mashed and passed through a sieve, or served as a purée. To free them from their skins and tough fibrous portions, the same treatment is often necessary with peas and beans, when first added to the dietary. This is always necessary with squash. Salsify should be stewed, not fried. Beets (owing to their tendency to traverse the gastrointestinal tract undigested), turnips, and sweet green corn, it is wise to postpone until five years of age; although sweet corn, if thoroughly grated and freed from the husk, is often acceptably assimilated at an earlier age (four years). Sweet potatoes, baked or roasted, though often tabooed, I can see no objection to; nor to properly-prepared stewed tomatoes (the latter should always be cooked for three hours, thoroughly mashed, and passed through a sieve). Puddings and other desserts should not be too sweet, and ice-cream occasionally, especially on Sundays and holidays, lends additional charm to those days.

Supper or Tea (6 to 6.30 P.M.).—Broths and milk soups; milk; milk-toast, steamed crackers with milk, cereals, rice; lettuce (plain dressing); bread and butter, zwieback; stewed fresh and dried fruits, fresh fruits, baked apples and apple-sauce (without cream); plain cake.

Supper is a notoriously difficult meal to cater for, especially as the child grows older. Meat should never be given. Lettuce I regard as very valuable, especially in winter, when there is a dearth of fresh vegetables; it may be commenced at four years, and should be plainly dressed. Excellent and appetizing are the soups with milk as a basis; they may be made with corn, rice, asparagus, peas, celery, lettuce, tomatoes, tapioca, oysters, and clams. Jams and jellies should be avoided.

When the age of six is reached, the dietary may be enlarged. To the breakfast may be added liver (calves' only), broiled, or, possibly, carefully fried, but certainly not stewed—a process that renders this meat tough; ham occasionally, broiled only, and cut thin; stewed potatoes, fresh (not bought) Saratoga chips, and, at nine years, French fried potatoes (only on condition that they are properly cooked—*i.e.*, dry and free from grease).

At the dinner, tender roast veal, but in no other form, is admissible; boiled ham occasionally; boiled mutton; green corn (well grated); sliced tomatoes; parsnips (well boiled, never fried);[1] carrots (young and tender); and Brussels sprouts. Little change is required in the desserts at this age. To the fresh fruits already mentioned, pears, huckleberries, blackberries, cherries (at eight years), cantaloupes, watermelon (in moderate quantity), and bananas may be added. This last fruit is very nutritious, and may be eaten, scraped or baked, in small amounts, at seven or eight years; it must be thoroughly ripe, and yet not overripe. All fruits should be fresh, sound, and ripe, especially in hot weather. Pastries, pies, and dumplings should still be among the forbidden articles. Tender roast veal and broiled ham, although usually prohibited, are, as a rule, readily digested; they may, for the sake of variety, be given occasionally to healthy

[1] Parsnips are not particularly palatable, and need to be well prepared to make them attractive.

children at eight or nine years, but other forms of pork are to be avoided. Unless a good brand can be purchased, ham, because of the danger of trichinosis, should be omitted from the diet of children; adults can take the risk, if they wish.

To the supper may be added raw and stewed oysters (without eyes); sliced tomatoes, from time to time, as a substitute for lettuce; and, now and then, pure jams, in place of stewed fruits. Cucumbers ought not to be eaten at all. At this age, meat may be taken twice a day, if the child appears to need it. As the tenth year is approached, more substantial foods will be required at supper by many children, such as scrambled or poached eggs, omelettes, and cold meats; also various kinds of breads (brown, rye, and corn bread), to vary the monotony.

At ten years, griddle cakes, muffins, and waffles, and well-made pies and pastry, may occasionally augment the bill of fare. Griddle cakes should be eaten with salt and butter, in preference to syrup. Figs and dates may be taken at the same age, *as a part of the dessert only;* they have a high food value, if well masticated.

When the age of twelve is reached, the diet of children may be substantially the same as that of adults. Dinner may be taken in the evening, when this is the custom of the family. Entrées, condiments, spices, rich and highly seasoned dishes, and shell-fish (lobsters and crabs) should be regarded in the same light as they are in relation to the diet of adults—*i.e.*, though harmless to healthy individuals, and very valuable and appetizing as occasional foods, they are not suitable or advisable for the every-day dietary.

Milk and water are still the best beverages; although chocolate, as an occasional drink, is not objectionable after the tenth year. Children are better without tea and coffee until after the age of puberty, and *absolutely* without alcoholic drinks of every kind until a much later period.

Candies are strictly forbidden for all children by every authority I am acquainted with. This, I think, is a mistake. The liking for sweets in the young is, I believe, not an acquired but a natural taste—a demand created by the ceaseless activity of the youthful organism. It is a significant fact that athletes in training usually crave sugar. A little candy, at proper times, is not harmful, provided that a pure and unadulterated article is selected. Candies should always be given with meals, as a part of the dessert, or in place of it; a good plan is to reserve them for Sundays and holidays, thus making these festivals red-letter days in the little ones' existence. Nuts may be taken in the same way (*i.e.*, with meals), but sparingly, and not before the seventh or eighth year. The active laxative qualities of nuts and simple candies may be made use of with advantage, in constipated children.

That candies, or anything else, should not be eaten between meals is a rule never to be departed from. Much of the harm usually attributed to many forbidden articles of food is due, I feel convinced, to this reprehensible practice, rather than to the particular foods taken. Children addicted to this habit are usually overfed, frequently suffer with indigestion, and have little appetite for regular meals. The same is true of hurried eating, insufficient mastication, and improper cooking. The former two should be corrected while the child is still young; and the latter could be improved, if physicians were more familiar with the culinary art themselves. The hurried breakfast, so common in American families, is especially to be avoided; schoolchildren, particularly, should have ample time to eat this meal with leisure.

Very important, indeed, is the food of the schoolchild. Nourishing, well-cooked, and varied foods, with plenty of eggs, milk, and meat (and fat bacon, in cold weather, for active boys and girls) are proper during this period. The breakfast should be substantial and digestible; so, also, the lunch. This meal, for children under six, should consist, as at home, of milk or broth, with bread and butter or crackers. For older children a lunch is not required, unless there is but one session, or the school is distant from home. Sandwiches of meat, and in children of ten, of cheese, eggs, milk (hot broths or cocoa when available), and fruit or plain cake, are suitable luncheon foods. Some private schools now provide hot lunches for children who come from a distance; but they should discountenance the practice of eating and prohibit the too common sale of pastries, candy, and cakes during the recess hour.

In outlining any dietary scheme for children, the social position, as well as the pecuniary circumstances, of the family

must be taken into account. The time of the meals, the foods to be selected, and the methods of their preparation will be much affected by such conditions. It is obvious that what may be recommended with confidence among the well-to-do may not be advisable with the children of the mechanic. The mistress' knowledge of the art of cooking, and the capacity of the cook, will also influence us in the kind of foods we suggest. We can recommend certain foods when we know that they will be properly prepared, which we would hesitate to do in households in which the knowledge of cooking is crude and deficient. Notwithstanding this, the main principles governing the diet of childhood may be successfully carried out in any household, if the parents possess willingness, perseverance, and ordinary self-control.

In advising a liberal diet for children, I am fully aware that the tendency of people to err in this direction is greater than the reverse—that they need restraining more than urging, especially the parents of the mechanic and poorer class, who are apt to feed their offspring on food unsuitable both in character and in the method of preparation. Particularly harmful is the practice, so prevalent among this class, of permitting even the youngest children to drink strong tea and coffee, and sometimes beer. At the same time I am convinced that it is to the child's present and future physical and moral well-being that it be taught to eat every wholesome article of food; and that much of the opprobrium attached to many articles of diet is, in reality, due to eating between meals, to improper preparation, and to hurried eating and overeating. Finally, it is well to remember that in feeding a child the simplest and most digestible meats and vegetables should first be given; then, as the child grows older, other wholesome articles should be successively added, until the ordinary diet of adults of its class and station is arrived at. Further, it should be borne in mind that the stomach of the child is an organ that does not differ from the adult's in that it grows strong with the using and weak with the non-using—that it literally grows by what it feeds on; and, still further, that individualization is often an essential factor in the successful nourishment of children.

RESULTS OF TREATMENT IN NINETY-FOUR CASES OF PULMONARY TUBERCULOSIS.[1]

By F. M. Pottenger, A.M., M.D.,
Professor of Clinical Medicine, Medical Department of the University of Southern California, Monrovia, Cal.

In making this report we wish once more to emphasize the fact that tuberculosis is a disease which will yield to intelligent, persistent treatment. We also wish to emphasize a fact which we believe to be of equal importance, viz., that much more can be done for patients suffering from tuberculosis than furnishing them with good food and keeping them in the open air. This disease is too serious to permit us to depend upon any one line of treatment. We must individualize. While we keep our patients in the open air all the time, and furnish them with an abundance of the best food for building them up, yet this is but a small portion of the treatment which we use. We endeavor to guide our patients most cautiously as regards the amount of rest and exercise which they should take; use various forms of baths and packs; violet rays from concentrated sunlight; raw meat and muscle juice; inhalations and care of the nose and throat; tuberculin and other culture products as are indicated; streptolytic serum in cases showing mixed infection; drugs whenever necessary to meet existing symptoms; and whatever other measures seem to be indicated in individual cases. We believe that this is the only rational method of attacking a diseased condition so complex as we find in the average case of tuberculosis, and we further believe that our results justify our method.

We can approach a case of early tuberculosis to-day with a great deal of assurance, for we know it to be a disease even more curable than typhoid fever or pneumonia. If we wish, however, to obtain the same results as we would in these other diseases, we must attack it early and use the same care that we would in these diseases.

Perhaps no one thing emphasizes the importance of early diagnosis in tuberculosis so much as the medical reports of sanatoria. These afford us statistics of hundreds of cases, and, coming from all sections of the world, show what can be

[1]Read before the Los Angeles County Medical Society, Jan. 27, 1906.

done for patients suffering from early tuberculosis when treated under the best of circumstances. Prior to the sanatorium era there was little effort made to cure the disease, and very few men ever thought of reporting their results. These sanatorium reports impress upon us the great advantage afforded patients by an early diagnosis, and speak louder than words of the necessity of the early recognition and early treatment of tuberculosis.

While the importance of early treatment has been so thoroughly demonstrated, yet but a small percentage of our patients come under that classification. Those sanatoria which confine their efforts to the cure of early tuberculosis are forced to reject a large percentage of applicants, even after they have been passed upon and referred to the medical director. By this process of weeding out, public institutions are enabled to fill their beds with fairly early cases; but even then some unfavorable ones creep in.

The reason for confining public institutions to early cases is in order to do the most good to the greatest number with the funds expended, believing that it is better to treat three or four individuals a year who can be cured in three or four months each, rather than fewer who would require longer time.

Private institutions, on the other hand, cannot be so careful in choosing. The medical directors of private sanatoria feel that they must give their best efforts to applicants, even though the cases be difficult ones. This accounts for the large percentage of advanced and far advanced cases in the reports of private institutions, and must always be taken into consideration in comparing results. It must also be remembered that the length of time necessary to produce a satisfactory result increases with the severity of the illness, and the chances for such a satisfactory result diminish materially as the disease advances.

This does not mean, however, that there is no hope for those who are farther advanced. Nearly all patients, except those *in extremis,* will improve if given the proper treatment, and many of them can attain an arrestment of their disease, and quite a few can ultimately go on to a cure, even when the disease has become advanced. This requires, however, a considerable expenditure of both time and money, that would not have been necessary had the treatment been instituted in the early stage of the disease, and does not contradict that generally accepted truth, that the early case is the favorable case.

Our experience teaches us that there is one type of advanced tuberculosis for which much can be done—that is, the type of chronic non-febrile tuberculosis which has shown resistance to the disease. Advanced cases running a rapid course offer little opportunity; but those in whom the progress is slow, and in whom the disease has existed for quite a time, it may be years, can oftentimes be restored to lives of usefulness. It seems that in such cases a certain resistance or immunity has been developed. A chronic case of tuberculosis, even with extensive involvement, provided the heart is good, and there is no organic disease of the stomach, is not necessarily a bad case for sanatorium treatment, provided the patient is willing to do his part. Of course, it must necessarily take a long time to attain the desired result in these cases.

There is a great difference between infection and the time that the disease affords sufficient symptoms to call the patient's or the physician's attention to the fact that tuberculosis is probably present. In this series of cases the first symptom of tuberculosis was inquired into carefully, with the result as shown in the following table. Many of these cases were suffering from a second and third outbreak of the disease, so the time given does not mean the time that they showed the first symptom of the outbreak for which they were seeking aid, but the probable first symptom of tuberculosis which the patient could remember. In some instances this was a hemoptysis, in some a pleurisy, in some a general run-down condition with loss of appetite and weight, night sweats, with or without cough, which could not be accounted for otherwise. In some it was a continuous series of colds, where the history could not be mistaken. In some no history could be elicited previous to the finding of bacilli, while others dated their illness from a pneumonia, and a few to a supposed typhoid fever.

A glance at the table will show at once that the class of patients with whom we are dealing are not easy ones, for they have nearly all been ill long enough to have their general constitutions more or

less undermined, and also many of them have serious complications. Yet in spite of this excellent results have been attained.

by the local tuberculin reaction. In twelve of these a satisfactory result was attained, and no further reaction to tuberculin could be obtained, while in one other all

TABLE I.

Length of illness before the beginning of treatment.

	6–9 months.	9–12 months.	1–2 years.	2–3 years.	3–5 years.	5–7 years.	7–10 years.	10–15 years.	15–20 years.
No. of patients...	8	8	21	14	17	10	10	4	2

A point in treatment, which is not usually sufficiently understood, is the length of time necessary to bring about a satisfactory result. So often patients have been comforted with the thought that they only have "bronchial trouble" or "throat trouble" that nearly all are led to believe that they are just about to acquire tuberculosis or that they have it in the incipient stage, when in truth the disease is advanced and often far advanced. The idea of a three-months' cure of tuberculosis, unfortunately, has become wide-spread. This is based upon the reports of certain German sanatoria, where none but incipient cases are treated, and where the usual term of treatment is but three months. This term often proves too short for incipient cases, and unfortunately the impression has gained publicity that the term for cure in tuberculosis is three months, regardless of the stage. No fixed time can be set. It varies with the case, and may require three months in one instance and three years in another. This much can be said, too, that many cases which are only improved at the time of discharge, and many cases which are arrested, if treated longer would attain a cure.

There are certain complications which naturally interfere more or less with the progress of patients and in some instances prevent recovery. Tuberculous involvement of the larynx has long been looked upon as a fatal complication, but to-day we know otherwise. A very large proportion of cases of tuberculosis of the larynx will heal out under proper, persistent treatment; especially is this true in those cases in which the general constitution is not too much undermined. The improvement in the larynx is usually coincident with that in the lung. In the cases included in this report there were fifteen instances of tuberculous laryngitis. The diagnosis was confirmed in every instance

activity ceased and the larynx gave the picture of an arrested process.

In one patient showing symptoms of tuberculosis of the bowel, loose, pulpy stools, with sharp, griping pains, which symptoms were increased on several different occasions accompanying a tuberculin reaction, a cessation of the bowel symptoms took place. It is to be regretted that the feces in this instance were not examined to confirm the diagnosis, but our after-experience with tuberculin in other cases of tuberculosis of the bowel strengthens our belief in this being a case of cured tuberculous enteritis. If tuberculosis of the lung and larynx will heal out, why can we not have a healing in the bowel?

It will be readily appreciated that, in order to obtain such results, the patients must be under the most favorable conditions. A large portion of the cases reported from the sanatorium could not have been treated at all in private practice; but by having them under our immediate control very satisfactory results have been obtained in many advanced and far-advanced cases. It will be noticed further, in comparing results, that those patients treated at the sanatorium attain these results not only more certainly but also more quickly than did those who were treated outside of the institution.

Our method of treatment consists in doing everything that we can for each individual patient. While we believe that fresh air and good food are essentials to the cure of tuberculosis, we also feel sure that they are not incompatible with many other remedial measures; while we believe that a favorable climate exercises a beneficial influence upon tuberculosis, and believe that Southern California possesses one of the most favorable, yet we do not allow this to check our efforts in behalf of our patients. We consider tuberculosis

as a serious disease, and believe that we are not doing our duty by our patients unless we use all measures that we believe will aid in producing a cure.

One of our greatest aids in the treatment of this disease is the judicious use of culture products. With an experience now of nearly ten years in their use, we feel that we cannot be mistaken in the value which we place upon them, and, contrary to the usual opinion, we believe that they are indicated in suitable cases in all stages of the disease, and that they are relatively of more value to the individual suffering from an advanced condition than to the one with an incipient process. An advanced case certainly needs all the help that can be afforded, for his vitality is lower and the burden upon his system is greater. We have used some form of culture products upon every patient reported here. We employ for the most part the watery extract of tubercle bacilli, of von Ruck.

The specific action of tuberculin can no longer be doubted, and its power to confer immunity has been established beyond question by the experiments of Koch, Spengler, von Ruck, and others, who have shown its power to increase the agglutinating power of the blood, and more recently by the investigations of Wright and Bulloch, which show that the opsonic power of the blood can be raised even above normal by injecting tuberculin. The local stimulation of the tuberculous areas in the lung also affords a great aid to healing.

One of the most convincing proofs of the value of tuberculin is its action on tuberculosis of the larynx. Here we can watch its action day by day. We can measure our dosage exactly by the reaction caused, and we can see the disease improve in the great majority of cases. One fact in the treatment of tuberculous laryngitis must always be kept in mind—that is, that the cure is slow; but persistence will crown our efforts. In the cases reported here twelve out of fifteen had an apparent healing, and one an arrestment, although it took many months in some instances to produce the result.

We note with pleasure that the former bitter opposition to the use of culture products is passing away, and that their use is becoming more general. We feel sure that much better results will follow in the cases in which they are intelligently employed than in which the cure is left to the ordinary routine of fresh air, good food, and proper hygiene. It is unfortunate that these remedies are not suitable for administration in ordinary office practice, for in this way they could be brought to a greater number; but the only safe method of employing them is to have the patients absolutely under the control of the physician. The temperature, breathing, expectoration, must all be watched, as well as the local reaction in the chest, or throat, if it be affected. The physician employing tuberculin should not only understand his remedy and the disease he is treating, but should also be capable of making a thorough, intelligent examination of the chest.

One thing worthy of notice is the small number of hemorrhages which we have had in the institution. During the two years there were only seven amounting to more than a mouthful of blood, and two of these were in the same individual.

A very large percentage of the patients gained in weight. It is the usual thing for patients to gain two to two and a half pounds per week until they regain most of the weight which they have lost; however, we sometimes see gains of a pound a day, and in a few instances have noted as much as nine pounds in a single week. In some cases, however, we note either very little or no gain until the patient has been under treatment for some time, and then the patient begins to slowly put on weight. While the mere putting on of weight is no indication of the condition of the lungs, nevertheless an increase is always welcomed, for it is an indication of the ability of the patient to digest and assimilate; and in tuberculosis the question of cure depends very much upon these two factors. Table II shows the average loss prior to treatment and average gain or loss during treatment.

Only one first-stage patient lost weight, and that was due to vomiting of pregnancy. In this case a good test of the results was given by the completion of pregnancy and birth of a healthy child with no ill effect upon the mother. Two second-stage patients showed a loss of weight: one treated in the office, the other in the sanatorium. This was a matter of two and three-quarter pounds in one case and three in the other. Of the third-stage patients treated in the office, two lost weight; of those in the sanatorium, ten.

TABLE II.

Showing average number of pounds lost before treatment began and average number of pounds gained or lost during treatment for each stage of the disease and each result obtained.

OFFICE CASES.

No. of cases.	Stage of disease.	Apparently cured.		Arrested.		Improved.		Unimproved.		Dead.	
		Average pounds.		Average pounds.		Average pounds.		Average pounds.		Ad.	Dis.
		Lost on ad.	Gained on dis.	Lost on ad.	Gained on dis.	Lost on ad.	Gained on dis.	Lost on ad.	Lost on dis.		
8	I	4.56	4.78	.....	.....	.....	.....	.....	.....	.....	.....
1	I	.....	.....	8	4	.....	.....	.....	.....	.....	.....
7	II	4.86	8.81	.....	.....	.....	.....	.....	.....	.....	.....
6	II	.....	.....	9.29	9	.....	.....	.....	.....	.....	.....
1	III	+13.	+15.	.....	.....	.....	.....	.....	.....	.....	.....
8	III	.....	.....	11.72	11.09	.....	.....	.....	.....	.....	.....
2	III	.....	.....	.....	.....	10.5	6.25	.....	.....	.....	.....
2	III	.....	.....	.....	.....	.....	.....	26.5	8.25	.....	.....

SANATORIUM CASES.

No. of cases.	Stage of disease.	Apparently cured.		Arrested.		Improved.		Unimproved.		Dead.	
		Average pounds.		Average pounds.		Average pounds.		Average pounds.		Average pounds.	
		Lost on ad.	Gained on dis.	Lost on ad.	Gained on dis.	Lost on ad.	Gained on dis.	Lost on ad.	Lost on dis.	Lost on ad.	Lost on dis.
5	I	4.4	10.	.....	.....	.....	.....	.....	.....	.....	.....
1	I	.....	.....	11.	8.5	.....	.....	.....	.....	.....	.....
6	II	8.5	16.92	.....	.....	.....	.....	.....	.....	.....	.....
1	II	.....	.....	.5	11.5	.....	.....	.....	.....	.....	.....
4	III	8.75	12.62	.....	.....	.....	.....	.....	.....	.....	.....
22	III	.....	.....	13.94	13.33	.....	.....	.....	.....	.....	.....
15	III	.....	.....	.....	.....	20.37	3.93	.....	.....	.....	.....
3	III	.....	.....	.....	.....	.....	.....	19.16	17.	.....	.....
2	III	.....	.....	.....	.....	.....	.....	.....	.....	13.	5.5

Thus there was a loss of weight in fifteen patients out of ninety-four, an average loss of ten and a quarter pounds. Seventy-nine gained weight, averaging ten and a half pounds. The above table shows that those patients who were apparently cured, in all stages of the disease, whether treated in the office or sanatorium, raised their weight above normal; those in whom the disease was arrested were not quite able to regain what they had lost; those who were improved fell still farther short, while the unimproved showed a loss of several pounds. From this we might draw one of two conclusions: either that the result obtained depends upon the patient's power of digestion and assimilation, which is generally believed, or that accordingly as these patients improve, so does their power of digestion and assimilation improve.

A change which is always gratifying to both patient and physician is the disappearance of bacilli from the sputum. While this is far from meaning that the patient is well, yet it means that the process is a closed one and relieves the patient of all danger of reinfecting himself through his own sputum, relieves him partially of the danger of secondary infection, and places him where he cannot infect his friends.

We are gratified to note that of the 94 cases reported by us to the present time (Table V) which showed bacilli in the sputum, 34, or 36.17 per cent, lost their bacilli during treatment, which is a very satisfactory percentage when we consider that 70.22 per cent of the cases were in stage III. Bacilli disappeared in 83.33 per cent of the cases in stage I, in 72.73 per cent of stage II, and in 19.7 per cent of stage III.

This report covers a period from April, 1903, to January 1, 1906, and includes all of the cases of tuberculosis treated either in our private office or sanatorium who were under treatment for a period of more than two months. Since the establishment of the sanatorium, office treatment has almost ceased. I report those treated in the office and those in the sanatorium separately, since the former did not have the advantages of the institution. They were

an easier class of cases, yet in order to obtain satisfactory results we were compelled to treat them much longer. Of those treated in the office, 22 or 62.86 per cent were in stages I and II, and 5 or 38.46 per cent of the stage III cases were favorable for treatment, while of those treated in the sanatorium, only 13 out of 59, or 22 per cent, were in stages I and II, and only 14, or 30.43 per cent, of the stage III cases were considered favorable for treatment. Without the close personal care afforded by the institution, a great number of those reported from the sanatorium could have had no hope of improvement. The following tables give a summary of the results:

Aside from the patients included in this report, there have been thirty-seven others who remained in the institution for a period varying from a few days to two months. Some of these were cases unsuitable for treatment; others were so far advanced that they lived only a short time after reaching the sanatorium, and others came that they might learn how to live and care for themselves. While we endeavor to take no patients whom we think we cannot benefit, yet at times we find patients who have only a few weeks to live forced upon us by the fact that they have come long distances directly to the institution without our knowledge of their condition, and often without our knowledge of their coming. Humanity compels us to enter them. It is manifestly unfair to the cause of tuberculosis, however, to allow such cases to enter into the statistics which determine the curability of the dis-

TABLE III.

OFFICE CASES.

Stage.	No. of cases.	App. cured.	Arrested.	Improved.	Unimproved.	Tuberculin test.	Bacilli.		Remarks.
							Ad.	Dis.	
I.	9	8=88.8%	1=12.2%	.....	.....	7	2	0	100 per cent lost bacilli.
II.	13	7=53.85%	6=48.15%	.....	.....	3	10	4	60 per cent lost bacilli.
III.	13	1=7.62%	8=61.54%	2=15.38%	2=15.38%	.....	13	10	23 per cent lost bacilli.

TABLE IV.

SANATORIUM CASES.

Stage.	No. of cases.	App. cured.	Arrested.	Improved.	Unimproved.	Dead.	Tuberculin test.	Bacilli.		Remarks.
								Ad.	Dis.	
I.	6	5=83.33%	1=16.67%	.....	.....	.....	4	2	1	50 per cent lost bacilli.
II.	7	6=85.7%	1=14.3%	.....	.....	.....	1	6	...	100 per cent lost bacilli.
III	48	4=8.69%	22=47.83%	15=32.6%	3=6.62%	2=4.36%	.....	46	39	15.22 per cent lost bacilli.

If we add to the cases in Tables III and IV the twenty-seven cases reported previously,[1] we have a total of 121 cases, as follows:

TABLE V.

Stage.	No. of cases.	App. cured.	Arrested	Improved.	Unimproved.	Dead.	Tuberculin test.	Bacilli.		Remarks.
								Ad.	Dis.	
I.	27	25=92.6%	2=7.4%	.....	.....	.....	20	6	1	83.33 per cent lost bacilli.
II.	28	19=67.85%	7=25%	.....	2=8.15%	.....	6	22	6	72.73 per cent lost bacilli.
III.	66	5=7.58%	32=48.48%	22=33.33%	5=7.58%	2=3.03%	.....	66	53	19.7 per cent lost bacilli.

[1] "The Rational Treatment of Pulmonary Tuberculosis." *American Medicine*, Sept. 19, 1903.

ease; therefore I have only counted in this report those who remained more than two months. This report does not include fifty-seven patients who are at present under treatment.

In our classification of cases and results we have endeavored to follow the report of the Committee on Nomenclature of the National Association for the Study and Prevention of Tuberculosis. We classed those as:

Apparently cured: Where all constitutional symptoms with expectoration and bacilli were absent for three months and the physical signs were then of a healed lesion.

Arrested: When constitutional signs were absent, and physical signs stationary or retrogressive for a period of two months at least. Expectoration with bacilli either present or absent.

Improved: When there was an amelioration of constitutional symptoms, the physical being either improved or unchanged.

Unimproved: When essential symptoms had not improved or had increased.

In certain cases the necessary time limit of the classification had not elapsed when the patient left the institution, but all such were followed up after discharge.

PROGRESS IN SERUM THERAPY DURING THE YEAR ENDING JUNE 1, 1906.[1]

By Ezra Read Larned, M.D.,
Chicago, Illinois.

The principal points to which I wish to direct your attention are the following:

1. Classification of sera as to their being efficient or inefficient.
2. Efforts to produce new sera.
3. Efforts to improve sera which have been inefficient for the purpose intended.
4. Investigations into the possibility of making efficient antigonorrheal and antisyphilitic sera.
5. Wassermann's serum in the treatment of diphtheria.

The court of last resort in the determination of any remedial agent intended for the prevention or cure of pathological conditions of human beings is the practicing physician who actually treats the cases. It makes no difference how pretty the theories are: if they do not work out in practice they are valueless for practical purposes. It does not matter if the experiments on laboratory animals or the test-tube reactions bear out the theories, the remedial agent is of no benefit in the treatment of disease unless it does the work expected of it by the doctor at the bedside.

Bearing these preliminary suggestions in mind, I have seen no reason for changing the classification of curative sera which I made in the paper which I had the honor of offering to you at our last year's meeting. If you will remember, I divided sera into three classes:

Class I included all those sera whose efficacy had been definitely proved by overwhelming evidence.

Class II covered the sera whose value had not been definitely proved; and

Class III all those sera whose value had been shown to be negative for clinical purposes.

I think there can be no question as to the justice of this classification, arbitrary though it may be.

The medical profession is too largely composed of men who do their own thinking and judging to be influenced by bald statements unsupported by sufficient evidence to prove their accuracy beyond any doubt. With us an authority has weight only in so far as it is known to be accurate and an honest record of facts. Honesty of purpose is of no avail unless the results will actually do what is expected or claimed for them.

These remarks will explain to you the attitude in which I approach this exceedingly important subject, and the criterion by which I gauge the value of the various sera which have been offered to the medical profession as remedies for the allevition, and in some cases prevention, of certain pathological conditions presumably amenable to the actions of sera.

Unfortunately, I cannot include in Class I (or those sera which have been absolutely proved to be of value beyond the question of a doubt) any additional sera to those included a year ago. Last year I included antidiphtheric, antitetanic, antistreptococcic, and antiplague sera; and while our literature of the last twelve months contains a great deal of very interesting and valuable writing upon these and other sera, I contend that no

[1]Read at the fifty-sixth annual meeting of the Illinois State Medical Society, Springfield, May 17, 1906.

evidence has been brought to bear sufficient to include any other than those mentioned in Class I.

In Class II, I put antithyroidin, thyroidectin, and serum for exophthalmic goitre, hay-fever serum, tuberculin, antianthrax serum, and serum for relapsing fever.

In Class III (or those sera whose efficacy for the purpose intended is *nil* at present) I must still include antipneumococcic, antidysenteric, antityphoid, antivarioloid, anticancer, antierysipelas, antirabic, antimalarial, antirheumatic, antianemic, antisyphilitic, and antigonorrheal sera, and leprolin.

There have been three notable efforts in behalf of new sera made known in the literature during the last year: one on the preparation of a serum for exophthalmic goitre; another on the production of an antigonorrheal serum; and another in the rapidly accumulating evidence in support of the contention that in the spirochæta pallida, or as some prefer to call it, the treponema pallida, we have at last found the etiologic factor in the causation of syphilis.

ANTIDIPHTHERIC SERUM.

Antidiphtheric serum still continues to lead the list as the ideal specific serum, and no sane man can deny its efficacy in the prevention and cure of diphtheria. It is harmless in itself—the administration of a pure serum never has done, and probably never will do, any damage to a patient; but the administration of this agent in sufficient quantity, if given early enough, will almost certainly cure every case of diphtheria so treated, and will prevent the occurrence of the disease in those subjected or exposed to infection. Every now and then some physician complains of the antitoxin when he loses a case to which he has administered antidiphtheric serum, and in each case where it has been possible to make careful investigation of all the circumstances surrounding the case, it has been found that either the administration of serum was begun too late, after toxemia had become profound, or grossly insufficient quantities of the serum had been used.

If doses containing enough antitoxin to immunize the entire quantity of toxin in the body were administered in each and every case of diphtheria before serious harm has been done by the toxin, the mortality would be zero. This is self-evident. It is daily demonstrated in the laboratory, and is proved in actual practice in the management of all well-treated cases. Too many physicians are prone to use too small doses of antitoxin. If anything has been learned in the last few years in the treatment of diphtheria, it has been the truth of these two statements: first, the absolute harmlessness of antidiphtheric serum; secondly, the superiority of large initial doses administered at the earliest possible moment. Too many physicians are content to await developments and use large quantities of antitoxin only in the severest cases and as a last resort. The criminal folly of such delay is too obvious to require further discussion.

I have been asked many times by physicians as to the propriety of administering synchronously antidiphtheric serum and antistreptococcic serum, especially in cases of scarlatina in which the Klebs-Loeffler bacillus has been discovered in the nasopharyngeal exudations, and I have invariably offered the advice that inasmuch as these sera in themselves were harmless and would cause no more damage than injection of so much sterile water, it is perfectly proper to administer them in cases in which there can be the slightest possiblity of infection. In all suspected cases, or, to put it differently, in every case in which there is the slightest suspicion of infection by diphtheric germs, the administration of one or two thousand units of antidiphtheric serum is not only safe, but good practice.

A very comprehensive test of the value of antidiphtheric serum in scarlatina was conducted by Lopez, who stated that in his experience early curative doses of antidiphtheric serum administered in scarlatina aborted the disease, curtailed the suffering, and lessened the risk to the patient: one dose of two thousand units being sufficient, in the average case of sore throat due to bacterial infection, to effect a speedy cure. He also finds that the antidiphtheric serum is equally effective in all angina cases, whether they be scarlatina, tonsillitis, quinsy, etc. There seem to be no contraindications. Lopez insists that it should be remembered that the largest quantities of serum may be required in the most severe cases, ranging from twenty thousand even to one hundred thousand units, which doses are not

depressing to the heart and are not attended by bad results or sequelæ.

Local Action of Antidiphtheric Serum.—It is well known that the Klebs-Loeffler bacillus may persist for a long time upon the mucous membrane of the patient's throat. Although in some cases the bacterium disappears rapidly, yet frequently cultures have shown positive results after fifteen or twenty days, and in certain cases positive results have been obtained one, two, or three months after the patient has apparently recovered from diphtheria. The antidiphtheric serum injected under the skin seems to have no effect on vitality of the germ in such cases. In attempting to abbreviate the time of isolation of this class of contagious patients, antiseptic measures have been recommended, such as swabbing with iodized glycerin, silver nitrate, hydrogen peroxide, etc. Nevertheless, the results have not been satisfactory.

Dopter reports some interesting experiments on the local action of antidiphtheric serum, and his report is of much interest.

Recently Wassermann, of Berlin, reported that the serum obtained from the blood of horses immunized against the cultures and the toxins of diphtheria germs possesses the property of producing marked agglutination of the bacteria when applied to the throats of patients. Vogelsberger reports his experience with Wassermann's serum and stated that it caused the disappearance of the bacilli from the mucous membranes of the throats of diphtheria convalescents. We thought this question of sufficient importance to immunize a horse according to Wassermann's method, which was to inject not only the toxins but the actual cultures of the diphtheria germs. Some of this serum was desiccated and administered to patients both in the form of a powder and in the form of a tablet. Thirteen cases of diphtheria were given the desiccated serum. Whether this method possesses any great advantages I am unable to say. As yet the experiments have not been carried on far enough to warrant any definite conclusions. In the thirteen cases referred to the germs disappeared on an average in eight and one-thirteenth days, which is somewhat less than the average in other methods of treatment.

Huber has made a preliminary report upon the use of antidiphtheric serum in the treatment of epidemic cerebrospinal meningitis, and claims that there was observed in most cases an amelioration of all the clinical features, and no ill effects followed in the series of cases in which the antitoxin was given. The method of administration was by lumbar puncture, four to six drachms of spinal fluid being allowed to escape, and then from fifteen hundred to two thousand units of antitoxin slowly injected.

ANTITETANIC SERUM.

Antitetanic serum I include in Class I, because I believe that is where it belongs. No matter what your individual opinion may be in regard to its curative value, there is no question whatever of the prophylactic and immunizing value of antitetanic serum. There has been adequate evidence offered in support of this statement I think. The curative value of antitetanic serum is just as great as that of antidiphtheric; the trouble has been that the chemistry and pathology of tetanus is little understood by the vast majority of physicians. We are also handicapped by our inability to offer an accurate dosage of antitetanic serum, such as we have in antidiphtheric. No one has yet been able to definitely standardize antitetanic serum, and to provide a unit standard such as makes the administration of antidiphtheric serum so accurate as to dosage. A vast amount of work has been done in this direction, however, and I confidently believe that before another twelve months pass something of extreme interest in this connection will be found in our literature.

I urge you all to seriously consider your grave responsibility in the prevention and treatment of tetanus. The 4th of July will soon be here, and while there is evidence on the part of the public of an increasing desire to do away with the "Insane Fourth" and to limit the expressions of enthusiasm on that occasion to something less dangerous than the unrestricted use of gunpowder and dynamite, it is too much to expect the average small boy to give up firecrackers, giant crackers, giant caps, toy pistols, and all the other fascinating but deadly implements of mimic warfare. Fourth of July infections have been the most prolific in the production of cases of tetanus, and unless you know positively that there has been no tetanus infection possible, you owe it to your patient and

to your own conscience to act upon the assumption that if tetanus is not probable in your case it is certainly possible, and to take measures to render your patient immune against the tetanus which might follow if you did not take such action.

ANTISTREPTOCOCCIC SERUM.

I have included antistreptococcic serum in Class I because there seems to be no doubt that in a large proportion of cases of pure streptococcic infection this serum has acted most beneficially. What is probably responsible for the cases in which the serum has given indifferent results is the fact that these cases of sepsis were complicated by organisms other than the streptococci, and upon which antistreptococcic serum would have little, if any, effect. Antistreptococcic sera are still somewhat experimental, but on the whole very encouraging for true streptococcic infection.

In the recent French Congress of Surgery, Willems reported the result of protective injection of antistreptococcic serum prior to surgical operations within the mouth. It was especially in uranostaphylorrhaphy that the beneficial effects of this procedure were noted. Instead of the usual gray-looking, unhealthy wound following this operation, the edges were clean and clear and red. The difference was very striking as compared with the usual method. The dose in such cases was twenty cubic centimeters the night before the operation, and perhaps a second injection of the same quantity at the termination of the operation.

Kanel reports the results of treating sixteen cases of acute and five of subacute articular rheumatism with Menser's antistreptococcic serum obtained from living cultures of streptococci which were isolated from rheumatic patients and used to immunize horses. The author announces that the serum is entirely harmless, and has given very good results in some cases.

ANTIPLAGUE SERUM.

Antiplague serum seems to merit inclusion in Class I, as a very careful investigation of the entire subject and close study of the literature inevitably lead to the conclusion that it is of positive value when given in large doses and repeatedly.

Antiplague serum is probably of passing interest only to the vast majority of American physicians, as bubonic plague is exceedingly rare in the United States. With the increase of our foreign interests, however, and the passing back and forth of our citizens from the Philippines and China, particularly of the troops, the possibility of seeing cases of bubonic plague becomes much more likely. The only case of which I have any personal knowledge was that of a worker in our laboratory, who became infected from handling pathological material from cases of plague found among the Chinese in San Francisco, and he was exceedingly ill for a time. The serum, which was fortunately on hand, undoubtedly saved the patient's life. This man, by the way, is now a worker in the government laboratory in the Philippine Islands.

This completes sera I have included in Class I, and I now take up the consideration of Class II, or those sera whose value has not been definitely proved.

SERUM FOR TUBERCULOSIS.

The most important announcement for the year, perhaps, was Behring's address at the International Congress in Paris, in October, 1905, in which he claimed to have discovered a cure for tuberculosis. He declined to make any definite statement as to its nature or the method of its preparation, but from what he did say it seems to be an outgrowth of his vaccination method of protecting cattle from this disease. He vaccinates cattle with live cultures of human tubercle bacilli, and claims thereby to protect them against the disease.

Recognizing that it would be manifestly impossible to undertake the inoculation of human beings with live tubercle germs, he seems to have attempted the breaking up of the dead germs into an essential or immunizing portion and a non-essential or injurious portion. He removes this latter portion by extracting the germs, first with water, then with salt solution, and lastly with alcohol and ether. The portion remaining after these extractions he injects into men or animals, and claims that by the union of this body with the cells they become immune to tuberculosis.

Considering Behring's announcement in the light of his own and other experimental studies, we are allowed to assume

that he has entered upon a new line of work. It seems though that his method was based upon propositions not original with him, but elaborated by others before him, particularly Metchnikoff and Klebs. How much mankind is already to profit by Behring's work cannot be predicted, as his carefully though ambiguously worded statements mean nothing but a possible, but unproved, hypothesis of a principle which may be applicable in tuberculosis.

Some interesting experiments have been conducted in the treatment of skin tuberculosis, particularly of the face, with tuberculin and the *x*-ray combined, comparing results of this treatment with those of the use of the *x*-ray alone. I am informed that the tuberculin treatment is far more beneficial. I understand that a full report of this work is to be published later.

HAY-FEVER SERUM.

A final decision as to the value of the serum treatment of hay-fever does not yet seem to be warranted. From the mass of experience and literature rapidly accumulating we may hope soon to arrive at a conclusion. I expect that during the approaching hay-fever season a much more systematic effort to determine the value of the serum treatment of hay-fever will be made than ever before, and the results of this work will go far toward the ultimate inclusion of hay-fever serum in its proper class.

SERA FOR EXOPHTHALMIC GOITRE.

Last year I included thyroidectin in Class I. This year I include it in Class II, simply because it is only the truth to say that sufficient evidence has not been accumulated to warrant our calling this a true curative serum. Some cases do not respond well to the treatment, and in a few instances have even shown an aggravation of the symptoms, although it is true that the vast majority of cases of true exophthalmic goitre are greatly benefited by the use of this serum. Thyroidectin is the name given to the blood of animals which have been subjected to the removal of the thyroid gland, and a period of two or three weeks after their recovery from the operation they are bled, and the whole blood, under strict aseptic precautions, dried and powdered. This is administered by the mouth, in doses of from five to ten grains two or three times a day, as each individual case seems to require.

The effects of the administration of this blood are diminution of the tachycardia, reduction in the size of the goitre, lessening of the exophthalmos, and disappearance of the sweating, tremor, and fatigue. One notable effect is the increase in weight of many patients taking the blood from thyroidectomized animals. Ries reports one case in his practice in which the gain in nine months was seventy pounds.

Antithyroidin is the name given to the serum of the blood of thyroidectomized animals. The administration and action are quite similar to those of the whole blood.

The researches of Beebe and Rogers, in the production of a serum for the treatment of exophthalmic goitre, in which they have used the normal and the pathological human thyroid gland, make exceedingly interesting reading. The clinical reports which these investigators have offered are certainly too important to be ignored, and it may be that these men have at last hit upon a method which will eventually provide us with a means of successfully treating this baffling condition.

SERUM AGAINST RELAPSING FEVER.

It appears, from the work of Norris, Papenheimer, and Flourney, as well as Novy and Knapp, that the blood of rats which have been given repeated injections of spirochætal blood exerts a most marked preventive and curative action. The application of this discovery to the treatment of relapsing fever will probably soon follow, and if it should prove as effectual in man as it is in the white rat it will afford a method of prevention and successful treatment.

ANTHRAX SERUM.

Wilms injected Soberheim's anthrax serum into a man who had a left-sided swelling of the face, neck, and chest, following the appearance of an anthrax pustule over his left brow. Difficulty in swallowing and nausea developed, and his general state became gradually worse. He was given twenty cubic centimeters of anthrax serum directly into the median vein; this was followed by profuse sweating. The injections were repeated from day to day until he had received six in-

jections—in all 115 cubic centimeters. The patient recovered. In a second case no general symptoms existed, but the face and neck were much swollen, the result of the anthrax. He received two injections. The author gives the entire credit for both recoveries to the serum.

Now we come to Class III, which comprises all those sera whose value has been negative, or practically so, for the clinical purposes for which they are intended.

ANTISYPHILITIC SERUM.

There is nothing new in animal therapy for syphilis. If the present tendency to look upon the spirochæta pallida as the causative factor proves well founded it will, of course, discredit all the previous antisyphilitic sera which are being offered, and which are, so far as I am able to learn, of questionable value. So far as I can discover, the spirochæta has not yet been grown in pure culture, and much less has any serum been produced by its use.

ANTIGONORRHEAL SERUM.

The only contribution toward an antigonorrheal serum was made by Torrey. Torrey's serum appears to be of no value in acute or chronic gonorrhea, but has given some surprisingly good results in gonorrheal rheumatism. Torrey has grown pure cultures of the gonococcus in a mixture of ascitic fluid and beef tea, and used rabbits for the production of the serum.

In the treatment of gonorrheal rheumatism by antigonococcic serum, the serum is injected into the subcutaneous tissue in the back of the patient's arm in doses of thirty to forty minims. The dose may be repeated on successive days, according to the requirements of the case. The serum has little or no effect upon the urethritis, and so long as that disease persists recurrences of the articular complications may be looked for.

ANTIPNEUMOCOCCIC SERUM.

While encouraging reports appear from time to time in the literature regarding the use of antipneumococcic serum, a regard for scientific accuracy compels the statement that antipneumococcic serum is as yet on the whole very disappointing and exerts no appreciable effect upon the course of the disease which can be directly attributed to the serum and which cannot be duplicated by other measures than serum therapy, and the death-rate from this disease still remains disgracefully high.

ANTISCARLATINAL SERUM.

The production of a specific serum for scarlet fever is yet to be accomplished. Hamilton, Campe, and Ganghofner have reported good results from the use of certain forms of antistreptococcic sera, but no specific serum has yet been produced which will do for scarlatina what antidiphtheric serum does for diphtheria.

ANTITYPHOID SERUM.

Although the production of an effective curative serum for typhoid fever would be of tremendous value to therapeutics, yet the carrying out of this result is beset with so many difficulties that the desired result is still to be accomplished. As evidence of the work already done, I cite the reports of Stokes and Fulton, Rodet, Josias, Brunon, and Chantemesse.

CANCER SERUM.

Some time ago it was dramatically announced by Dr. Doyen, the well-known Parisian surgeon, that he had perfected a serum which would cure cancer. He asked the Paris Surgical Society to appoint a committee to investigate his claims. This was done, and after five months spent in investigating the facts these experts have submitted their report to the society. It is anything but favorable. According to the report, the serum when first used causes a temporary improvement in some cases, but it never cures. Of the twenty-six cases examined, twenty became much worse under the treatment. The opinion is expressed by the committee that Dr. Doyen mistook his desires for facts.

Thomson records four cases treated by Doyen's serum. In the fourth case it was found that the disease was not malignant. In the other three cases the serum was injected, with recurrence and a rapidly fatal result in all three cases. In other words, the serum had no effect whatever upon the progress of the disease.

Doyen's serum is obtained from the micrococcus neoformans, isolated from malignant growths.

Of another kind, however, are the experiments by Clowes, who gives a preliminary report on some investigations

suggested by the fact that while there are many authentic cases of recovery from carcinoma, no attempt has been made to determine the effect of the serum of these spontaneously recovered cases upon those suffering from similar affections. Mice were used for these experiments, inoculated with material from two supplied by Professor Jenpen, of Copenhagen.

The method pursued was to treat in each case two affected mice at the same time, one with injections of blood derived from mice recovered from the disease, the other with a similar amount of ordinary mouse's blood. Up to the time of making the report, experiments had been carried out on twenty mice; and of those treated with repeated doses of the so-called immune serum, one only has failed to show some effect which may be attributed to the serum, and all are alive. Of those treated with normal serum, five are already dead, and the others have now tumors larger than those for which they served as controls. Tumors weighing more than three or four grains were not appreciably affected by the serum, but the cachexia from which the mice suffer in the last stages was in all cases alleviated. The serum of mice cured of their tumors by the above treatment was found to possess a certain degree of activity, but not to the extent exhibited by that of the spontaneously recovered cases.

ANTIRABIC SERUM.

Nothing has yet been produced in the way of an antirabic serum which possesses any value, either for curative or immunizing purposes.

SERUM FOR MALARIA.

The antitoxin treatment of tertian malaria is still very much in the future. Reports show that nothing has been produced along this line.

FATIGUE ANTITOXIN.

Weichardt has been publishing some very interesting accounts of the production of fatigue toxins and antitoxins. The idea seems to be that the antitoxin would be adopted for use in various sports, for soldiers undertaking prolonged marches, for the prevention or relief of fatigue, and also might be applicable in diseases in which a powerful tonic is required. It is suggested that the proteid molecule has a tendency, at the beginning of its disintegration, of splitting up into toxic substances, with the formation of by-products which have important physiologic and pathologic properties. The fatigue toxin does not disappear under simple chemical combinations, but forms antibodies which act against the toxic products of disintegration. The substance of Weichardt's own account of his discovery is as follows: He pulled guinea-pigs back and forth over rough ground until they were extremely tired and showed a sinking of the body temperature. Under careful antiseptic precautions he obtained some muscle plasma, which compared with the normal flesh, was redder in color, and tasted bitter. Animals into which it was injected in any quantity died promptly. Weichardt procured some of the dialyzable material of the residue, which in a few weeks became absolutely dry and at a low temperature remained active. Injected into animals, it produced an antitoxin which conferred a species of immunization against weariness. These experiments are far from complete, and may not be of any practical value, but are decidedly interesting.

ANTIERYSIPELAS SERUM.

Mastri reports from Rome three cases of erysipelas which seemed to be cut short or very favorably influenced by two injections of antidiphtheric serum. He injected five hundred units in children and one thousand units in a man of sixty and a woman of thirty-five, repeating the injection twice in the course of one or two days.

Fornaca instituted some interesting experiments. A severe epidemic of erysipelas in Turin gave him an opportunity of obtaining serum from convalescents, and injecting it almost immediately into other cases, he compared the results with those obtained by the older treatment. The epidemic was severe. The cases treated by local applications and the usual general measures lasted from nine to fifteen days, with high temperature and serious illness. Nine cases were given the serum treatment. In each case the process was localized in the face. The serum was taken from the worst of the cases, being removed from the arm on the second or third day of convalescence and kept on ice for a short time before use. The day of injection varied from the third to the

eleventh day of the illness; the number of injections from one to three; the amount injected at one dose from ten to fifty cubic centimeters; the total amount administered from twenty to ninety cubic centimeters. The influence of the injection was usually seen in the fall of temperature, return of appetite, a feeling of well-being, a rapid disappearance of headache. It favorably affected the general condition of the patient both subjectively and objectively, but not the local erysipelatous condition. Fornaca concludes that the serum has no bactericidal effect upon the streptococci, but diminishes their virulence.

Ayer reports fifteen cases of erysipelas treated with antistreptococcic serum, and adds the reports from thirty-three cases treated by others. The author states that the shortening of the average duration of the disease by two and six-tenths days in those treated with serum, as compared with a series of seventy-nine cases treated by older methods, about expresses the value of this form of treatment.

Fornaca believes that the injection of the serum from a patient convalescing from erysipelas exerts a favorable action on the evolution of this disease. He also notes that the local process is not modified in any way whatever.

ANTIEPILEPTIC SERUM.

Geni has endeavored to prove that there is a specific serum in the blood of epileptic individuals, and has published the result of his researches on the antitoxic elements of the blood serum of epileptics in which he has endeavored to show the therapeutic properties of this serum. A careful investigation of his reports discloses that his results are practically negative, so far as showing any therapeutic value of the serum is concerned.

ANTIDYSENTERIC SERUM.

A great deal of work has been done during the last year on antidysenteric serum, and while it is true that there have been quite a number of cases favorably influenced, it seems to be the consensus of opinion that in America, at least, antidysenteric serum has been disappointing.

SERUM FOR ANEMIA.

Norsa's experiments with four anemic patients treated with a prepared antianemic serum were not promising. The serum treatment caused a transient increase in the number of figured elements in the blood, but this soon passed away and no permanent benefit was apparent.

Berti describes his experience with a serum prepared by immunizing a sheep with the serum of a patient ill with ankylostomiasis in an advanced stage. The antibodies generated thus in the sheep were assumed to be beneficial in the treatment of other cases of miner's anemia. Three cases were observed by the author in which the serum was given experimentally, but only a moderate degree of improvement was secured. The author thinks, however, that better methods of manufacturing the serum would give more pronounced benefit in the treatment.

CYTOTOXIC SERA.

An improved form of cytotoxic serum was produced in New York by S. P. Beebe, working under the Huntington Fund for Cancer Research (see *Journal of Experimental Medicine,* vol. 7, p. 733). All cytotoxic sera heretofore made have not been strictly specific. They have all had more or less hemolytic action, and some have been decidedly toxic for the cells of other organs. This common action is probably due to certain constituents which are common to the bodies of many cells. Hence Beebe decided to use only the nucleoproteids of the cell for the production of a specific cytotoxic serum, as these are the characteristic constituents of the cell *par excellence.* He removed the blood from the organ selected (say liver of a dog) most carefully, minced it fine, extracted with water, and precipitated the nucleoproteids with acetic acid. This precipitate was dissolved in dilute alkaline solution and reprecipitated until pure, then used for injection into animals. The blood serum of these animals, when injected into another dog, caused degeneration of the liver and practically no other changes.

The end aimed at in this work is, of course, the treatment of cancer. If, when a cancer is removed, it could be worked up, and by it a serum produced which injected into the patient would destroy any injection in the wound or any metastatic growths left behind, it would be of great service. Beebe has shown that a highly specific cytotoxic serum can be produced. It remains to be seen whether a cancerous

growth is sufficiently differentiated so that it can be destroyed without involving the structures from which it sprang.

There have been two new words introduced into scientific nomenclature, "opsonin" and "aggressin." Opsonin was introduced by Wright and Douglass (see Proceedings of the Royal Society, vol. 72, Sept. 1, 1903, and vol. 73, Jan. 11, 1904) to designate that power of blood serum which, by acting on bacteria, prepares them for ingestion by the phagocytes. Aggressin was introduced by Bail and Weil to designate the offensive weapon of the bacteria by means of which they are enabled to invade an animal and overcome it.

The pleural or peritoneal exudate of an animal just dead of some infection, when freed of bacteria, contains the aggressin in available form. If a portion of this liquid be injected into another animal at the time of inoculating it with the same infection, this animal dies much sooner than a control animal receiving a similar infection but no aggressin. An otherwise not fatal infection can be made to kill by a simultaneous injection of aggressin.

The opsonic power of the blood is measured by mixing a portion of defibrinated or citrated blood with an emulsion of germs, incubating, then counting the number of germs ingested by the white blood cells.

Blood serum is tested by mixing with washed blood-corpuscles and an emulsion of bacteria, incubating, and counting as before. The opsonic power of the blood varies but little with different well individuals or at different times of the day. It is, however, destroyed by heat and gradually disappears from blood after it is drawn from the body. The opsonin represents the body's power of resisting the attack of a germ, and the aggressin represents the germ's power of attack; their relative proportions will largely determine the issue in an infectious disease.

I thought it might be of interest to those who care to read up on this subject to arrange a bibliography slightly different from the customary manner, and I have, therefore, prepared a list of contributions on the subject of serum therapy which have appeared in the English and foreign literature in 1905 and thus far in 1906, arranging the literature references in the two years mentioned and subdividing them under the heads of the various sera discussed.

RECENT LITERATURE ON SERUM THERAPY.

1905.

Antidiphtheric Serum.

1. Dopter (*Gaz. des Hôp.*, April 4, 1905): "Local Action of Antidiphtheritic Serum."
2. Louis Fische (*N. Y. Med. Jour.*, June 24, 1905): "Clinical Experiments with Antitoxin and the Advantages of Large Doses."
3. E. Vogelsberger (*Deutsch. Med. Woch.*, Sept. 21, 1905): "A New Serum for Diphtheria."
4. L. C. Layson (*Am. Med.*, Oct. 28, 1905): "Report of a Series of Experiments to Determine the Antitoxic Depreciation of Antidiphtheritic Serum."
5. A. K. Yost (*N. Y. Med. Times*, April, 1905): "History of Antitoxin in the Treatment of Diphtheria, with Reasons for its Success."
6. F. Huber (*Med. News*, April 15, 1905): "Diphtheria Antitoxin in Epidemic Cerebrospinal Meningitis."
7. Biernacki and Muir (*Jour. A. M. A.*, Jan. 21, 1905): "Intravenous Injection of Diphtheria Antitoxin."

Antitetanic Serum.

8. G. Mornac (*Presse Médicale*, No. 12): "Epidural Injections of Antitetanic Serum."
9. John Rogers (*Jour. A. M. A.*, July 1, 1905): "How to Use Antitoxin in Tetanus."
10. N. W. McMurphy (*Proceed. N H. Med. Ass'n*, 1905): "Serum in Tetanus."
11. C. F. Davidson (*Md. Med. Jour.*, November, 1905): "Tetanus Antitoxin."
12. Melesio de Anda (*Am. Med.*, Dec. 9, 1905): "Success of Antitetanic Serum."

Antierysipelas Serum.

13. L. Fornaca (*Brit. Med. Jour.*, July, 1905): "Treatment of Erysipelas with Serum from Convalescents."
14. L. Fornaca (*Il Policlinico*, July, 1905): "Treatment of Erysipelas by the Serum of Convalescents of this Affection."
15. Jas. C. Ayer (*Med. Rec.*, Aug. 26, 1905): "Serum Therapy in Erysipelas."

Antiplague Serum.

16. R. T. Marshall (*Va. Med. Semimonth.*, Dec. 22, 1905): "Bubonic Plague—Cause—Dissemination—Forms—Clinical Symptoms—Serum Therapy."
17. M. Herzog and R. P. Strong (*Jour. of Tropical Med.*): "Plague Researches."

Tuberculin and Antituberculosis Serum.

18. E. Maragliano (*Medicine*, July, 1905): "Specific Therapy of Tuberculosis and Vaccination Against Disease."
19. Wm. E. Gamble and E. W. Brown (*Jour. A. M. A.*, Oct. 14, 1905): "Iritis Tuberculosa as Diagnosed and Treated by Koch's Tuberculin."
20. A. E. Wright (Lond. *Lancet*, Dec. 9, 1905): "Therapeutic Inoculation of Bacterial Vaccines in Tuberculous Disease."
21. A. E. Wright (Lond. *Lancet*, vol. ii, 1905): "Treatment of Tuberculosis by Tuberculin."
22. S. Liverato (*Gaz. deg. Osp.*, Dec. 17, 1905): "Action of Antituberculosis Serum."

Hay-fever Serum.

23. O. J. Stein (*Medicine; Ill. Med. Jour.; Chicago Med. Rec.*, May, 1905): "Dunbar Antitoxin Method of Treating Hay-fever."
24. John F. Barnhill (*Med. and Surg. Monthly*,

April, 1905): "Report of Use of Dunbar's Hay-fever Serum."

25. Adelbert Heindle (*Wien. klin. Woch.*, June 8, 1905): "Specific Treatment of Hay-fever."

26. H. W. Loeb (*Am. Jour. Otol., Rhinol. and Laryngol.*, June, 1905): "Serum Treatment of Hay-fever."

27. H. W. Loeb (*Jour. Miss. State Med. Ass'n*, August, 1905): "Recent Advances in Etiology and Treatment of Hay-fever."

28. H. W. Loeb (*Laryngoscope*, October, 1905): "Serum Treatment of Hay-fever."

Antipneumococcic Serum.

29. B. Castresana (*Diglo Medico*, No. 2667): "Antipneumococcus Serum in Corneal Ulcer."

30. D. Wanner (*Wuert. Med. Corresp.*, 1905): "Pneumococcus Serum in Corneal Ulcer."

31. D. Lindenstein (*Münch. med. Woch.*, No. 39, 1905): "Serum Treatment of Fibrinous Pneumonia."

Sera for Exophthalmic Goitre.

32. A. Alexander (*Münch. med. Woch.*, No. 29, 1905): "Basedow's Disease Treated with Antithyroidin."

33. A. Eulenberg (*Berl. klin. Woch.*, Oct. 30, 1905): "Basedow's Disease Treated with Antithyroidin."

34. Morre (*Reichs-Med.-Anzeiger*, No. 18, 1905): "Exophthalmic Goitre Treated with Antithyroidin."

35. S. Christens (*Hospitalstindende*, No. 15): "Treatment of Exophthalmic Goitre with Blood from Thyroidectomized Goats."

36. Sydney Kuh (*Medicine*, September, 1905): "Personal Experiences with the Serum Treatment of Exophthalmic Goitre."

Antityphoid Serum.

37. W. R. Stokes and J. S. Fulton (*Bost. Med. and Surg. Jour.*, May 18, 1905): "Curative Serum for Typhoid."

38. G. Appiani (*Gaz. deg. Osped.*, xxvi, No. 108): "A New Method of Serodiagnosis in Typhoid."

39. A. Rodet and Lagriffoul (*Lyon Médicale*, Dec. 24, 1905): "Experiments with Antityphoid Serum."

Antirheumatic Serum.

40. B. Kanel (*Deutsch. med. Woch.*, Sept. 21, 1905): "Serotherapy in Articular Rheumatism."

Antiscarlatinal Serum.

41. F. Ganghofner (*Deutsch. med. Woch.*, xxx, 529-592, 1905): "Treatment of Scarlet Fever with Antistreptococcic Serum."

Antianthrax Serum.

42. Wilms (*Münch. med. Woch.*, iii, 1905): "Serum Treatment of Anthrax."

Antiepilepsy Serum.

43. Carlo Ceni (*Centralbl. f. Nervenheilkunde und Psychiatrie*, No. 189): "The Specific Antitoxin of the Blood Serum in Epilepsy."

Hemophilia Serum.

44. P. E. Weil (*Presse Médicale*, No. 48): "Effectual Serum Treatment of Hemophilia."

Miscellaneous Sera.

45. L. Hektoen (*Jour. Infectious Diseases*, Nov. 18, 1905): "Experimental Measles."

46. Editorial (*Am. Med.*, Dec. 9, 1905): "Antitoxin for Mushroom Poisoning."

47. Federman (*Deutsch. med. Woch.*, xxxi, No. 18,731, 1905): "Treatment of Acute Peritonitis with Normal Horse Serum."

48. H. L. Burrell and H. W. Cushing (*Bost. Med. and Surg. Jour.*, May 11, 1905): "Serum Treatment of Septic Diseases."

49. Wm. E. Wilson (*Prov. Med. Jour.*, July, 1905): "Treatment of Inoperable Malignant Growths with Coley's Toxins."

50. Doeffler (*Jour. A. M. A.*, Jan. 21, 1905): "New Method of Producing Antibodies."

51. B. E. Kline (*Vratch*, Aug. 20, 1905): "Prevention Inoculation in Cholera."

52. H. B. Hollen (*Medicine*, March, 1905): "Oral and Rectal Administration of Serums."

53. E. R. Larned (*Ill. Med. Jour.*, August, 1905): "Present Status of Serum Therapy."

54. D. H. Bergey (*Pa. Med. Jour.*, December, 1905): "Protective Inoculations Against Bacterial Diseases."

55. W. Bulloch (*N. Y. Med. Jour.*, Dec. 9, 1905): "Principle Underlying Treatment of Bacterial Diseases by Inoculation with Corresponding Vaccines."

56. Risso and Cipollina (*Rif. Med.*, Nov. 30, 1905): "Serum Therapy in Syphilis."

57. Clowes (*Johns Hopkins Hosp. Bull.*, April, 1905): "An Immune Body Capable of Inhibiting the Development of Cancer in Mice."

1906.

Antidiphtheric Serum.

58. I. N. Snively (*Pa. Med. Jour.*, January, 1906): "Results of Timid Employment of Diphtheria Antitoxin."

59. R. B. Gibson (*Jour. Biolog. Chem.*, January, 1906): "An Improved Diphtheria Antitoxin."

60. F. E. Stewart (*Am. Med.*, March 24, 1906): "Serum Antidiphthericum."

61. J. H. Lopez (*Am. Med.*, Jan. 27, 1906): "Diphtheria Antitoxin Effective in Scarlatina."

62. Mastri (*Jour. A. M. A.*, March 31, 1906): "Antidiphtheric Serum in Erysipelas."

Antitetanic Serum.

63. Pergola (*Jour. A. M. A.*, March 31, 1906): "Preventive and Curative Use of Antitetanus Serum."

64. S. S. Frazier (*Am. Med. Comp.*, April, 1905): "Gunshot Wound of Eye—Tetanus—Treated with Serum—Recovery."

Tuberculin and Antituberculosis Serum.

65. E. Stadelmann and A. Benfey (*Berl. klin. Woch.*, Jan. 22, 1906): "Marmorek's Antituberculosis Serum."

66. W. W. Cheyne (Lond. *Lancet*, Jan. 13, 1906): "Tuberculin in Tuberculosis."

67. J. R. Clemens (*St. Louis Med. Rev.*, Feb. 3, 1906): "The Practice of Bacterial Inoculation as Guided by Wright's Opsonin Index Curve, with Special Reference to the Use of Tuberculin."

68. Krasue (*Münch. med. Woch.*, lii, No. 52): "Tuberculin Treatment of Febrile and Out-patients."

69. S. Liverato (*Gaz. deg. Osped.*, xxvi, No. 151): "Antibacillary Serum in Experimental Tuberculosis."

Antirabic Serum.

70. Fermi (*Jour. A. M. A.*, March 31, 1906): "Experimental Study of Rabies."

71. Materazzi (*N. Y. Med. Jour.*, April 28, 1906): "Cause of Rabies."

Antigonorrheal Serum.

72. J. C. Torrey (*Jour. A. M. A.*, Jan. 27, 1906): "An Antigonococcus Serum Effective in Gonorrheal Rheumatism."

73. John Rogers (*Jour. A. M. A.*, Jan. 27, 1906): "Treatment of Gonorrheal Rheumatism with Antigonococcus Serum."

Sera for Exophthalmic Goitre.

74. S. P. Beebe (*Jour. A. M. A.*, Feb. 17, 1906): "Preparation of Serum for Exophthalmic Goitre."

75. John Rogers (*Jour. A. M. A.*, Feb. 17, 1906): "Treatment of Exophthalmic Goitre with a Specific Serum."

76. Emil Ries (*Ill. Med. Jour.*, March, 1906): "Exophthalmic Goitre Treated with Thyroidectin."

Antityphoid Serum.

77. Bergey (*Pa. Med. Jour.*, February, 1906): "Protective Inoculations Against Typhoid Fever."

78. A. Chantemesse (*Presse Médicale*, Feb. 24, 1906): "Five Years of Antityphoid Therapy."

79. M. Josias (*La Tribune Médicale*, March 10, 1906): "Serum Therapy in Typhoid in Young Children."

80. Brunon and Josias (*Bulletin de l'Acad. de Méd.*, lxx, Nos. 8 and 9): "Serum Treatment of Typhoid Fever."

Antidysenteric Serum.

81. B. E. Kline (*Vratch*, Jan. 28, 1906): "Immunization against Dysentery."

82. S. Vaillard and Dopter (*Bulletin de l'Acad. dè. Méd.*, lxx, Nos. 8 and 9): "Serum Treatment of Dysentery."

Antianemia Serum.

83. Antonio Berti (*Gaz. deg. Osped.*, Feb. 18, 1906): "Anemia of Ankylostomiasis Treated with Serum."

84. G. Norsa (*Rif. Med.*, xxi, No. 48): "Serum Treatment of Anemia."

Hay-fever Serum.

85. Chas. A. Knight (*Med. Rec.*, March 10, 1906): "Serum Treatment of Hay-fever."

86. A. Loubert and C. Prausnitz (*Can. Jour. Med. and Surg.*, April, 1906): "Serum Treatment of Hay-fever."

Anticancer Serum.

87. A. Thomson (*Edin. Med. Jour.*, January, 1906): "Notes on Cases Treated with Doyen's Serum."

88. W. B. Coley (*St. Louis Med. Rev.*, April 7, 1906): "Late Results of the Treatment of Inoperable Sarcoma by the Mixed Toxins of Erysipelas and Prodigiosus."

89. A. Paine and D. J. Morgan (Lond. *Lancet*, April 7, 1906): "Doyen's Cancer Serum."

Antistreptococcic Serum.

90. F. Fromme (*Münch. med. Woch.*, Jan. 2, 1906): "Prophylactic and Therapeutic Use of Antistreptococcic Serum."

Fatigue Antitoxin.

91. W. Weichardt (*Münch. med. Woch.*, Jan. 2, 1906): "Fatigue Toxins and Antitoxins."

Miscellaneous Sera.

92. Editorial (*N. Y. Med. Jour.*, Feb. 17, 1906): "Prospect of a Protective Serum against Relapsing Fever."

93. Clipping: "Newer Uses of Antitoxin."

94. T. J. Horder (Lond. *Lancet*): "Experimental Serum Therapy."

95. Jas. R. Bloss (*N. Y. Med. Jour.*, March 17, 1906): "Serum Therapy."

96. Editorial (*Jour. A. M. A.*, April 7, 1906): "Serum Disease."

6325 Monroe Avenue.

A REPORT OF THE MANAGEMENT OF TUBERCULAR PATIENTS APPLYING FOR TREATMENT TO THE DISPENSARY OF THE SAMARITAN HOSPITAL, PHILADELPHIA.

By Mervyn Ross Taylor, M.D.,
Chief of the Medical Clinic and Adjunct Professor of Materia Medica at the Medical Department, Temple College, Philadelphia.

In considering the work done respecting the management of tubercular patients applying to the Samaritan Hospital dispensary for treatment, I may say that since my appointment four years ago there have been 42 patients who have suffered from pulmonary tuberculosis. Of these 42, 18 cases were classified as having the disease in its advanced stage, namely, showing well-marked areas of consolidation with cavity formation and constitutional disturbances. Seventeen cases were classified as moderately advanced, showing well-marked changes on percussion and auscultation, with more or less constitutional disturbance. Seven cases were classified as in the incipent stage, or showing but slight physical signs confined to one or both apices, and with mild constitutional symptoms.

Of the occupations showing the greater number of victims, those unfortunate beings working in mills and factories, or, in other words, those engaged in indoor work, give us the high average of 26 cases out of our total of 42.

It is also of interest to note that 2 cases of the disease occurred in Italian streetsweepers, and that 33 occurred in males and 9 in females.

Now as the management of pulmonary tuberculosis has within the last decade and a half become more or less revolutionized from a drug-administering disease to one based on sound dietetic, hygienic, and prophylactic principles for its cure and prevention, I believe that in general our aim and object should be:

First, to so instruct our patients in the execution of exact preventive measures necessary for them to take in order to lessen the spread of the disease, or, in other words, lift the veil of ignorance which still abounds in respect to its transmission from one individual to another.

Second, to insure a maximum of rest and fresh air.

Third, that milk and raw eggs, if tolerated, form the basis of diet.

Fourth, that a resort to drugs be made only when necessity arises.

In order to follow out the first rule bearing upon prophylaxis and the spread of the disease, I had these rules printed, which are a modification of the rules adopted by the Flick Institute of this city, for distribution to each patient applying for treatment:

1. Don't spit on the pavement, on the street, nor into any place where you cannot destroy the germs which you spit up.

2. Do not swallow any spit which comes up from your lungs or which comes out of the back part of your throat, as it exposes you to complications.

3. Spit into a spit cup when it is possible to do so.

4. Always use a spit cup with a handle to it, so that you can hold it close to your mouth.

5. When you use a china or earthenware spit cup, always keep chlorinated lime and water in it, and scald out the spit cup once or twice a day with boiling water.

6. When you use a tin spit cup with a paper spit cup inside, burn the paper cup at least once a day and scald the tin cup with boiling water.

7. Never use a handkerchief or a rag or any material other than paper to spit in or to wipe your mouth with unless it can be immediately burned after using.

8. When you cannot spit into a spit cup, spit into a paper napkin.

9. Always use a paper napkin to wipe your mouth with, after spitting, and be careful not to soil your hands.

10. Always carry a cheap paper bag in your pocket or caba to put paper napkins in which you have used.

11. When you have used a paper napkin, either to spit in or to wipe your mouth with, fold it up carefully and put it away in a paper bag.

12. Every evening, before going to bed, burn your paper bag together with the napkins which you have deposited in it.

13. Do not let any spit get on your clothing, or your lips and hands, or your bedclothes or carpets or furniture, or on anything about you, wherever you may be.

14. If, by any accident, any spit should be deposited anywhere else than in your spit cup or in your paper napkin, take pains at once to destroy it, either by taking it up and putting it in the fire or by putting chlorinated lime and water on it.

15. If you have a mustache or beard, shave it off or crop it close.

16. Always wash your lips and hands before eating or drinking, and rinse out your mouth.

17. If you have a running sore, take up the matter which is given off with absorbent cotton and burn it.

18. Don't blow your breath on to hot milk or any other food substance in order to cool it before giving it to others to take.

19. Avoid handshaking and kissing. These customs are dangerous to you as well as to others. They may give *others* consumption; they may bring *you* colds and influenzas which will greatly aggravate your disease and may prevent your recovery.

20. Do not cough if you can help it. You can control your cough to a great extent by will power. When you cough severely hold a paper napkin to your mouth so as not to throw out spit while coughing.

21. Sit out-of-doors all you can. If you have no other place to sit than the pavement, sit on the pavement in front of your house.

22. Don't take any exercise except upon the advice of your doctor.

23. Always sleep with your windows open, no difference what the weather may be.

24. Avoid fatigue. One single fatigue may change the course of your disease from a favorable one to an unfavorable one.

25. Go to bed early. If you are working, lie down when you have a few minutes to spare.

26. Don't take any medicine unless it has been prescribed by your physician. Medicine may do you harm as well as good.

27. Don't use alcoholic stimulants of any kind.

28. Don't eat pastries or dainties. They do not nourish you and they may upset your stomach.

29. Take your milk and raw eggs whether you like it or not.

30. Keep up your courage. Make a brave fight for your life. Do what you are told to do as though your recovery

depended upon the carrying out of every little detail.

31. Always keep in mind that consumption can be cured in many cases and that it can be prevented in all cases.

32. If your own disease is too far advanced for you to recover, console yourself with the idea that you can keep those who are near and dear to you from getting it.

Patients are earnestly requested to read these over at least once a week, adhere to them, and tack them up in a conspicuous place in their bedrooms.

By this means of placing within their hands set instructions for them to follow rather than giving them mere verbal directions as to the care of sputum, etc., I felt that I was best able to elevate my patients up to a higher standard of moral responsibility in carrying out protective measures which they owe not only to themselves and their families, but to the community at large.

The securing of a maximum amount of physical rest in the average ambulatory case of tuberculosis applying to a hospital for treatment is, I think, one of the most difficult problems that the dispensary physician is called upon to solve, for the reason that the vast majority of our cases occur in the laboring classes, who are solely dependent upon their meager daily earnings to sustain perhaps not only themselves but their families.

However, it is my custom to advise, whenever I can, the giving up of all work for as long a time as possible, with the following instructions as to rest and fresh air:

Patients should retire for the night at approximately 9 o'clock, and not rise until 9 o'clock the next morning. This gives them twelve hours of perfect rest in bed. They are told to sleep with all the windows open; to provide themselves with plenty of bedclothes, as chilling of the body by draughts is not only improper but dangerous; and a small, closely-fitting skull cap, or, better, a knitted hood, for the head should be worn in severe weather.

They should sit out in the open air, warmly clad, as much as possible during the day, taking a moderate amount of gentle exercise, always avoiding fatigue.

The main contraindications to exercise are hemoptysis and pyrexia. Whenever blood-spitting exists, even though it be extremely slight, I direct that the patient return at once to his house and remain quietly in bed for at least three days, or longer if the sputum be still blood-stained. Of the drugs which are claimed to exert a hemostatic effect in this condition, adrenalin chloride has, in my experience, yielded the best results, although it is not, I think, generally used.

I order that the patient shall take 10 drops of a 1-to-2000 solution every hour for three or four hours, then the same amount every two hours, gradually cutting the dose down as the symptom disappears, always instructing the patient to seek outside medical aid should the hemorrhage become worse. After the three or four days' rest in bed, and if able, they are told to return to the dispensary for examination and further advice.

The epidemicity of hemorrhage in tuberculosis has been noted by careful observers for many years, causing us to look upon it merely as a curiosity, but no attempt has been made to give us a proper explanation of it until recently. Flick, observing that because in pneumonia there usually is some evidence of hemorrhage in the rusty sputum, and with the view of throwing light upon the subject, made a series of bacteriological examinations, with the result that such blood-stained sputum revealed numerous pneumococci present, and he further reports an epidemic of hemoptysis occurring in his tubercular wards due to the presence of a case of pneumonia having been accidentally admitted.

In support of this statement I have frequently observed at post-mortems that in those cases in which hemorrhage had occurred, either as a terminal event or when it has been more or less marked during the course of the disease, the pneumonic areas which are so often found surrounding the active tubercular lesions were much more marked in these cases than in those which died without having preëxisting blood-spitting. Therefore the presumption is that pneumococci would have been found in the sputum of these patients if they had been looked for at the time of hemorrhage, and perhaps previous to its onset.

Accepting then the new etiological significance of epidemic hemorrhage being due, in a large majority of cases, to an

engrafted pneumococcic infection, the doubt arises, even knowing this fact, whether or not our present methods of arresting the condition can be improved upon except from a preventive standpoint.

From the first patients are instructed to take raw eggs and milk; my custom being to start on three eggs a day, which are to be beaten up in one quart of milk, and increased one egg and a half-pint of milk every third day, watching closely my patient's digestive functions, and stopping the milk and eggs entirely for a day or two, or cutting the quantity down, upon the appearance of the slightest digestive disorder, believing that any substance, be it food or medicine, which when administered disturbs the stomach to such an extent as to produce an absolute intolerance cuts off our main pathway by which foodstuffs gain entrance into the body to nourish it, and so combat the ravages of this, an exhausting, disease.

It is further my custom to flavor the milk with one of the vegetable flavoring agents, as vanilla or nutmeg, etc. This removes the flat taste of the milk, making it more agreeable to the taste.

In those who have an absolute abhorrence for the milk-and-egg diet, small doses of pure olive oil taken after meals and slowly increased have, in a few cases, proved of value, but at no time have I obtained such results as when the milk-and-egg diet was faithfully taken.

One case was able to take as much as one pint of pure olive oil a day, and showed a gain of 14 pounds in weight in six weeks. I weigh each patient once a week, or rather direct that he get weighed.

Of the results obtained from the treatment mentioned, I take pleasure in citing the case of a girl:

R. T., aged twenty-one; occupation, that of a dressmaker; living at home. She applied for treatment at the dispensary in July, 1904. Diagnosis: Incipient pulmonary tuberculosis.

There was well-marked disseminated consolidation in the apex of the right lung, but without cavity formation. On auscultation over the apex of the left lung there was revealed a slight prolongation of expiration, with a decidedly harsh vesicular murmur. Coughing was severe, with moderate expectoration. Her temperature was 100°, and pulse 95. Night sweats were not severe, but exhaustion, which was her main complaint, was unusually marked, and there were found tubercle bacilli in large quantities in her sputum.

She was at once ordered home, and to remain in bed for one week, at the end of which time her temperature was found to have dropped to normal, and remained so afterward. She followed out religiously the already described form of treatment, with the result that within six months she had gained 42 pounds in weight, and was then taking 12 eggs and 2½ quarts of milk a day.

Last September, when I saw her last, she stated that by necessity she was required to return to her work, and was feeling in good health. She was coughing very little, and her weight was 140 pounds.

Examination of her chest revealed very little evidence of her former trouble, although there was still some prolongation of expiration over both apices, with a harsh vesicular murmur.

This girl, it must be said, lived up to the treatment better than the average patient can be made to do. She occupied a third-story bedroom, slept by herself, practically in the open air, as the room had three large windows, all of which remained open the year round. She gave up her occupation for one year, took her milk and eggs regularly, and, in short, made the best of a brave fight for health.

This is only one of three cases which I have been able to follow upwards of two years, and which have yielded almost similarly gratifying results.

Of the special symptoms which at times demand treatment, that of excessive coughing warrants consideration, especially if the cough be of such severity as to disturb the patients' rest at night. It is my custom to administer heroin hydrochlorate, grain 1/24, every two hours, as it is my opinion that loss of sleep night after night, caused by a troublesome cough, is more detrimental to the health of the individual than any harm which may be produced by a sedative drug of the nature of heroin given in small doses.

For the relief of constipation, which is so often induced by the milk diet, I have found that the aromatic fluid extract of cascara sagrada, taken in small doses on retiring, or both night and morning if necessary, acts very well.

In regard to exercise and the practice of deep breathing, I firmly believe that they are potent for much good, especially the use of those exercises which have for their object the development of the chest and external muscles of respiration. Chest exercise is particularly indicated for those styled the pretubercular individuals, or, in other words, those whom we believe have a marked susceptibility to the disease by reason of their poorly developed chests in presenting marked supraclavicular and infraclavicular depressions, and other evidences which denote defective lung expansion.

Now in conclusion let us hope that before long our city health and charity departments, as well as our general hospitals, will be provided with sufficient funds to give the thousands of consumptive poor of this city sufficient facilities to make use of God's fresh air by day and by night, with other ample facilities for curing the curable and taking care of the hapless tubercular poor. We will then make greater strides toward the solution of the tuberculosis problem, and so realize again the truth in the statement of Pasteur, that it is within the power of man to rid the world of this disease.

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THE PRESENT STATUS OF OPERATIVE INTERVENTION IN EXSTROPHY OF THE BLADDER.

By A. P. Morgan Vance, M.D.,
Louisville, Kentucky.

Exstrophy of the bladder is by no means a rare anomaly, and is more often than otherwise associated with hypospadias, epispadias, or other congenital error of development or malformation of the genital apparatus, though occasional instances are observed where there appears to exist no other deviation from the normal genital conformation.

The essential anatomical characteristics of exstrophy consist in a deficiency of the anterior abdominal integument, the bladder being apparently turned "inside out," the internal aspect of the posterior parietes presenting on the surface (outwardly) above the symphysis pubis, the urine constantly discharging through the ureteral orifices which open upon the exposed bladder wall. Under these circumstances, there necessarily being no retainer for the kidney secretion, extensive excoriation of the external surface over which it trickles is the inevitable consequence. The distress incident thereto naturally becomes unbearable to the sufferer, and it is this discomfort rather than the deformity, *per se,* which causes relief to be sought. While in most instances of exstrophy there is non-union of the pubic arch, this defect is not invariably present.

As to the causation of exstrophy of the bladder little is positively known. The most that can be safely said is that like other developmental errors it is but a *lusus naturæ* which admits of no reasonable, or at least adequate, explanation.

The greatest surgical interest necessarily centers about the treatment of the malformation under consideration. By the employment of suitable compresses Mowat (1732) attempted to arrest the flow of urine from the ureters, thus hoping to obviate the extensive excoriation and distress which had hitherto prevailed. As might have been expected, this treatment was conducive to aggravation rather than amelioration.

No better results followed reduction of the protruding bladder parietes by Buxtort (1749), who also attempted to approximate and retain in apposition the edges of the abdominal wall over the bladder by means of adhesive strips. This procedure was likewise unsuccessful in the hands of Dupuytren *et al.,* some of whom also endeavored by bandaging the pelvis to secure approximation of the pubic bones.

By destroying the mucous membrane of the exposed bladder wall with caustics, thus substituting scar tissue for the sensitive mucous surface, Earl (1828) thought life might be made more endurable to the sufferer; but the attempt proved unsatisfactory, and death from septic infection resulted.

By temporary occlusion of the ureteral orifices Chassagnac (1842) sought to obtain sufficient dilatation of the ureters to create a substitute for the bladder; but symptoms of retention promptly developed, and this method of treatment was abandoned.

The first radical step toward closing the defect in the abdominal wall by plastic surgery appears to have been undertaken by Delpech (1828). A single flap of skin having been obtained from the hypogas-

trium, the edges of the bladder wall were freshened and the flap sutured thereto, with some degree of success.

Numerous plastic operations have been devised by different surgeons following the suggestion of Delpech, all having for their ultimate object the construction of a suitable receptacle for the urine, each operator modifying the technique to meet individual indications. The most notable among these is the method introduced by Wood (1875), in which three flaps were employed. The first was secured from the epigastrium, and with its epithelial covered surface was turned down to form an anterior bladder wall. The external raw surface was afterward covered by means of two lateral flaps, the pedicle of each being at a point near Poupart's ligament.

By lateral compression of the pelvis continued for several months with an especially constructed apparatus, Passavant attempted to obtain closure of the pubic arch; and after this had been accomplished it was the intention to close the bladder defect by plastic operation.

To facilitate approximation of the pubic arch Trendelenburg separated the sacroiliac synchondroses through an open incision, thereby rendering the lateral pelvic walls mobile. Some months later the bladder defect was closed by freshening the edges of the separated recti muscles and bringing them together by suture. He also sought to establish not only a new urethra but a sphincter for the artificial bladder, and in one case out of six so operated upon a satisfactory degree of continence was said to have been secured. Koenig suggested substitution of osteotomy of the anterior pelvic ring for diastasis of the sacroiliac joints as advocated by Trendelenburg.

After testing the methods advocated by Trendelenburg, Passavant, Koenig, *et al.*, Mikulicz advised that no attempt be made to approximate the pubic arch, and that the abdominal defect be closed by operation performed in three steps at intervals of several weeks. In the first step a new bladder was constructed by dissecting the posterior wall from its attachments, care being observed to avoid injury to the ureters; the bladder being then folded upon itself the edges were united by Lembert suture, thus forming a hollow space; two lateral flaps were secured by incisions parallel to the margins of the defect and passing entirely through the recti muscles; these flaps were still further loosened by separating the attachments of the recti muscles from the pubic bone, and were then approximated and sutured in the median line by silver wire; the lateral wounds were allowed to heal by granulation, during which process the urine was conveyed from the bladder by catheter. In the second step a new urethra was constructed from what remained of the urethral mucous membrane and corpora cavernosa (or labia). In the third step the neck of the bladder was closed and a catheter inserted through the urethra into the bladder.

Failing to secure favorable results from plastic surgery Simon (1851) sought to divert the urine into the rectum, this idea being suggested by the fact that in certain animals a permanent cloaca persists, and that in the human being such a condition is present during fetal life. He designed an instrument containing two stylets; this was introduced into the ureters and the stylets forced into the adjacent portion of the rectum; through the openings thus made sutures were passed which united the ureters to the bowel, ultimately causing the formation of apertures too large to close by cicatrization. A patient subjected to this operative procedure succumbed to chronic peritonitis following a partially successful operation. This was said to be the first ureterorectal anastomosis attempted.

Lloyd afterward endeavored to establish a permanent communication between the bladder and rectum, expecting to repair the abdominal defect later. A seton was passed through an ordinary trocar from the rectum into the bladder wall; this was removed seven days thereafter, and the patient perished from peritonitis the same day.

Simon's method was modified by Holmes (1862), who employed pliable metal tubes to preserve the patency of the apertures from the ureters into the rectum, but when the tubes were removed the fistulæ promptly closed. Later he adopted Lloyd's suggestion and established a vesicorectal fistula by means of a screw clamp, one blade of which rested upon the bladder, the other being passed into the rectum. Gradual approximation of the blades resulted in a patulous communica-

tion between the bladder and rectum, and after free flow of urine into the bowel was assured, the defect in the bladder was closed. Calcareous deposits in the newly-formed bladder necessitated prompt re-opening of this viscus, whereupon the rectovesical fistula speedily closed.

Rose (1872) observed a case in which the vesicovaginal septum had been completely destroyed as a result of diphtheria, and established an opening between the vagina and rectum two centimeters above the anus, subsequently closing the vaginal orifice by suture of the labia majora. The patient was afterward said to be able to retain her urine for three hours at a time.

Thiersch (1881) established a vesicorectal fistula in a female child having complete ectopia vesicæ associated with absence of the vagina and other genital anomalies. This was accomplished by causing necrosis (circumscribed) of the bladder wall from application of an enterotome. The patient apparently suffered no inconvenience from presence of the kidney secretion in the rectum, and the urine could be retained for three hours.

Sonnenburg (1881) extirpated the bladder (in a male) and transplanted the ureters upon the dorsum of the penis, the defect in the abdominal wall being closed by suture of the freshened edges; and von Itersen implanted the ureters in the labia majora in a case of exstrophy occurring in a female child.

Pousson (1888) secured a vesicorectal communication by cutting through and suturing the bladder to the rectum, and when union had taken place opened the rectum, the abdominal defect being afterward closed. Tuffier attempted the same procedure, but the results were unsatisfactory; a fistula persisted after the plastic operation, and the urine could not be retained longer than ten minutes at a time.

Maydl (1892) adopted a new operative procedure for exstrophy by which he hoped, by preserving the ureteral orifices, to guard against ascending (renal) infection. He transplanted the vesical trigonum (with the ureteral orifices) into the sigmoid flexure. In two cases reported by him (in 1894) the result appeared to be all that could be desired. Presence of the kidney secretion in the large intestine produced no unfavorable symptoms, and the patients were said to retain their urine from four to eight hours. Maydl's operation in brief consists in mobilizing a segment of the bladder into which the ureters open, removing all the mucous membrane excepting upon this segment, and implanting the segment (containing the ureters) into the sigmoid flexure of the colon, thus preserving the ureteral sphincters (?), and hoping thereby to prevent ascending infection.[1]

Other methods of implanting the ureters into the bowel have been designed, all of them more or less ingenious, in the hope of preserving the natural termination of the ureters. Krynski (1896), by turning back a seromuscular flap, implanted the ureters into the submucous connective tissue of the rectum, the urine being permitted to escape through a small opening in the mucous membrane; Vignoni placed the ends of the ureters upon a V-shaped flap taken from the anterior wall of the bowel, the ureters being covered by suturing over them two lateral folds of the bowel wall; Pisani transplanted the vesical trigonum, together with the ureteral orifices, upon the posterior rectal wall through an incision in the anterior wall; but none of these methods or modifications thereof proved entirely satisfactory.

Fowler (1898) presented before the Brooklyn Surgical Society a case of exstrophy of the bladder in which implantation of the ureters into the rectum by a new method had been successfully accomplished. After thoroughly cleansing the rectum the abdomen was opened in the median line, the patient (aged six years) being in the Trendelenburg position; the ureters were freely exposed by incising the posterior layer of the peritoneum, and were traced to their termination in the bladder, from which they were detached, the ends being cut obliquely. A longitudinal incision seven centimeters long was made through the serous and muscular coats of the anterior wall of the rectum; the edges of this incision were retracted until a diamond-shaped portion of mucous membrane was exposed, then a tongue-shaped flap with its base directed upward was cut from the mucous membrane of the bowel in the lower half of the dia-

[1] Peterson in 1900 collected thirty-six cases operated upon by different surgeons according to Maydl's method, thirty-three of which were for exstrophy. Of these five died as a result of the operation, and two perished later from infection of the kidneys.

mond-shaped space and doubled upon itself so that one-half of its mucous surface presented anteriorly, where it was sutured; thus a flap both sides of which were covered with mucous membrane was secured. The obliquely cut ends of the ureters were placed upon and sutured to the presenting mucous surface of the flap, and the valve-flap (with the ends of the ureters) was then pushed into the rectum, and the rectal and abdominal wounds closed. Prompt recovery followed; the rectum became remarkably tolerant of the presence of urine from the first day, urination occurring per rectum on an average of every three hours.

Fourteen months after the operation the child had shown no evidence of renal disturbance; defecation and urination took place at normal intervals; the movement was formed and not followed by nor mixed with urine. Regurgitation of urine and admission of feces into the ureters was prevented by the valve with mucous membrane applied to the open mouths of the ureters, and by pressure of the circular fibers of the bowel wall.

Matas (1899) claimed that all autoplastic operations thus far proposed for the cure of exstrophy of the bladder were unsatisfactory and at best simply palliative; that of radical methods which involve excision of the bladder, transplantation of the ureters into the rectum, etc., Maydl's operation offers the best hope of ultimate success. Notwithstanding the comparatively large number of successful cases accredited to this method, its relation had not yet been fully ascertained, though the ratio as obtained from published reports (over thirteen per cent) established its superiority over other procedures from a prognostic point of view. Matas admits that despite the apparent theoretical simplicity of its technique, Maydl's operation is difficult, laborious, and in many respects dangerous, and should only be undertaken by those who have thoroughly familiarized themselves with its difficulties by special training in abdominal surgery, supplemented, if possible, by experimental work. It should not be applied indiscriminately, and only those patients whose general condition is such as to warrant long, tedious operative intervention likely to be attended by serious shock, and those whose eliminating organs, especially the kidneys, are normal and capable of effective elimination, should be subjected to this procedure.

Josserand (1899) cites statistics covering the treatment of exstrophy of the bladder by ureterorectal anastomosis to the effect that of a total of eighteen patients operated upon there were but two operative deaths, one from shock and one from infection. There were several cases of urinary fistula complicated by localized peritonitis. Pyelonephritis had been observed in but a single case (that of Mikulicz), death occurring four months after operation. Several cases were followed for six to fifteen months without showing signs of kidney infection. Function was perfect in all but two cases; the urine could be retained for three to seven hours; the patients slept all night without inconvenience, and tolerance of the rectal mucous membrane remained perfect.

The author reports the case of a five-year-old child upon whom he operated. A bougie was passed into each ureter; the mucous membrane of the bladder was circumscribed by an incision carried down to the parietal peritoneum, and was dissected up; the ureters were isolated and mobilized for a distance of one and a half inches; then the bladder was resected, with the exception of a small area about the ureteral orifices. The operative region was thoroughly sterilized anew, and a celiotomy made an inch above the wound left by dissection of the bladder; the sigmoid flexure of the colon was drawn out, walled off by sterile compresses, and held in place by the fingers of the assistant; a longitudinal incision was made along the convex border of the sigmoid, and into this incision the trigonum was slipped. The anastomosis was completed by two layers of continuous sutures, one muco-mucus and the other seromuscular for the intestine, and muscular for the bladder. The suturing having been completed, the bridge of tissue which separated the two parietal wounds was divided and the viscera replaced in the abdomen. The parietal wound was closed except at the lower portion, where separation of the pubic bones made it impossible, and this space was tamponed with gauze. For the first few days there was some incontinence; afterward the child could retain the bowel contents during the entire night.

Beck (1900) speaks of the disadvantages of the ordinary operations suggested

for exstrophy. When flaps of skin are turned from the abdomen to form an artificial covering for the bladder, the hairs of the integument become encrusted with salts, no retentive power is possessed by the bladder, and use of a rubber receptacle is still necessary. Implantation of the ureters into the sigmoid flexure, the construction of a new bladder from a loop of intestine and transplanting the ureters into it, etc., are all dangerous (infection) and difficult of execution.

A new method described by Beck consists in freeing the margins of the protruding bladder walls, exposing and severing the recti muscles from their insertion at the pubes and partially from the transverse fascia, until they are sufficiently mobilized to be reflected and united, thus forming an anterior vesical wall.

In operating upon a boy five years old he further improved his technique and succeeded in creating a more solid anterior vesical wall. After the margins of the protruding bladder wall were freed (the incision line running through healthy tissue as much as possible) they were dissected backward about one centimeter; when it had been ascertained that the freshened margins could be approximated without tension, both recti muscles were exposed and incised along their internal margins to the extent of about half their thickness; two transverse incisions connecting the outer and inner margins of each rectus muscle, and extending down into the substance of the muscle to the same extent, completed outlining of the flaps. The lower incision lines were near the symphysis, and the other was below the umbilicus. Beginning at the internal margin of the incision the upper layers of fibers of the recti muscles were divided until the flaps formed could be lifted near the outer margin, with which they remained connected after the manner of a hinge. The bladder walls were united with thin iodoform-silk sutures, and the reflected muscular flaps were closed above. The subcutaneous suture was chosen for the integument, which was supported by four relaxation sutures, also consisting of iodoform-silk, applied three-quarters of an inch distant from the margins so there was no direct contact with the wound line. Thus a small but virtually normal bladder was secured, protected by a firm muscular layer likely to distend later on.

After a series of experiments on animals, in which the bladder was anastomosed to the rectum by means of his decalcified bone coupler, Frank (1900) suggested that the operation could be performed without infection of the kidney, and recommended it as a possible means of treating exstrophy. The advantages claimed for his method were: (1) Simplicity and brevity of operation; (2) absence of danger of ureteral constriction or of sloughing of the implanted trigone, as in Maydl's operation; (3) comparatively little danger of infection.

Halstead (1900) reported one case in which he made a vesicosigmoidal anastomosis, employing the decalcified bone coupler, and although death from shock followed he considers the operation practicable and believes it deserving of further trial. Halstead's description of the operation may not be devoid of interest:

Under chloroform anesthesia, with the patient in the Trendelenburg position, a curved incision was made circumscribing the upper margin of the defect, extending downward on each side toward the horizontal rami of the ossa pubes, to a point about opposite the ureteral openings. This incision outlined a flap consisting of the posterior bladder wall, being convex above and having its base on a line with the ureteral orifices. On turning forward this flap the sigmoid flexure of the colon was easily identified and drawn forward into the wound. At a point just below where the coupler was to be inserted, a posterior serous surface of the flap was united to the sigmoid by two sero-serous sutures of fine catgut; the bladder wall was then incised for a distance of about one and three-fourths centimeters longitudinally, the incision being placed at a point midway between the ureteral orifices and extending a short distance above a line drawn between these two points. After the introduction of a purse-string suture around this incision, a similar one was made at a corresponding point in the sigmoid flexure, the gut first being emptied and two Murphy intestinal clamps applied above and below; the coupler was then introduced and the purse-string tied. A new bladder, in the site of which was the coupler, was then constructed by suturing from above downward the flap consisting of the posterior bladder wall, and by utilizing the mucous membrane cover-

ing the upper part of the rudimentary penis and that corresponding to the defect in the pubic arch for a second flap, which was turned upward and united to the first by a series of interrupted Lembert sutures. The edges of the abdominal defect were then freshened and the recti muscles brought together by interrupted sutures of silkworm-gut, so that only a small portion of the anterior surface of the new bladder remained uncovered. The lower part of the defect remaining unclosed was loosely packed with iodoform gauze. The sphincter ani was stretched to allow the free escape of urine, and the wound was dressed in the usual manner, the abdomen first being supported by strips of adhesive plaster.

The time required to complete the operation was nearly two hours; the child was suffering from profound shock when taken from the table, but rallied somewhat during the night. Urine was voided through the rectum at intervals of about two hours, and there was apparently no escape of urine through the line of suture in the bladder. Death occurred sixteen hours after the operation. Post-mortem investigation showed not the slightest evidence of peritonitis, nor was there any leakage from the bladder; there was firm agglutination of the serous surfaces held together by the coupler. Death undoubtedly resulted from shock due to the prolonged operation.

The various operations hitherto suggested for exstrophy having proved unsatisfactory, Subotin (1901) devised a new procedure whereby a portion of the anterior wall of the rectum was employed as a reservoir and outlet for the urine. The rectum was exposed by excising the coccyx through a vertical skin incision carried downward from the third sacral vertebra, the posterior rectal wall being split from the anus upward to bring the anterior wall into view. The rectal mucous membrane was cleansed and a tampon inserted into the rectum. Directly above the external sphincter an incision three centimeters long was made through the anterior wall of the rectum and the corresponding portion of the posterior wall of the bladder. By a continuous suture of catgut the edges of the rectal wound were united with those of the vesical wound, forming a wide anastomosis between rectum and bladder. A horse-shoe-shaped incision into its open end extending into the perineal skin was then made through the mucosa of the anterior wall of the rectum around the anastomotic opening, the edges thereof being slightly reflected from the underlying muscles, folded over toward one another, and secured in position by a continuous catgut suture which included the muscle as well as the mucosa. By this means there was formed a pear-shaped reservoir, extending through the anterior part of the anus and opening on the perineum, which had free communication with the bladder but none with the rectum. The wound in the posterior wall of the rectum was united with a double layer of catgut sutures, and the skin incision closed except a point of drainage. The defect in the anterior wall of the bladder was covered by a flap from the scrotum, except an opening large enough to permit continuous catheterization, and a tube was placed in the rectum to allow free escape of flatus.

After two weeks a catheter was passed daily through the new rectal urethra, and at the end of six weeks the edges of the suprapubic fistula were freshened and united by suture, the bladder and reservoir being drained for a week by continuous catheterization through the rectal urethra. Thereafter the patient was able to urinate through the artificial urethra and continence was obtained by action of the sphincter ani.

The author employed this procedure in two cases and obtained satisfactory results, the patients having perfect control over the new bladder; urination took place five or six times daily, and defecation occurred simultaneously whenever the rectum contained feces. The absence of any communication between the rectum and the new reservoir effectually protected against ascending infection from the rectum, an accident prone to follow other methods of employing the rectum in operations for relief of exstrophy of the bladder.

Peters (1901) says transplantation of the ureters into the rectum would appear to hold out hopes of results highly preferable in those cases which survive; but unfortunately the mortality hitherto has been high. Death occurs either from peritonitis or ascending pyelonephritis; but with increasing knowledge of technique there is hope that the mortality may be

greatly diminished. If by thus converting the rectum into a cloaca the patient can retain his urine even from one to five hours, he is surely in much better position to take his part in life than he could possibly be with the best apology for a bladder that can be expected to result from any flap operation.

The author cites one case in which he transplanted the ureters into the rectum by an extraperitoneal method, with eminently successful results, and as his technique differs in some essential respects from any hitherto described, a full abstract of his case may be permissible:

Under anesthesia the sphincter ani was well dilated, and the rectum, having previously been cleansed by purge and enema, was irrigated with antiseptic solution of non-poisonous strength. A fair-sized sponge, to which was attached a tape, was passed as high into the rectum as possible, which not only prevented passage of fecal matter but materially assisted in raising the anterior wall of the rectum toward the bladder. A Jacques No. 5 (English) catheter was next passed about two inches into each ureter, and the part containing the eye cut off so that urine freely entered the opening upon the end of the catheter. A silk suture was then "caught" once or twice through the extreme end of the ureteral papilla and also passed by a needle through the substance of the catheter to effectually prevent its slipping out, as it was the intention to retain these catheters in position at least forty-eight hours. Care was observed not to obstruct the lumen by passing the thread across it or by tying too tightly. The distal end of the ureter with a goodly rosette of bladder muscle and mucous membrane was then dissected free, the catheter affording an excellent guide to its position. The idea was that whatever virtue there might be in the peculiar termination of the ureter upon the inner surface of the bladder, this should be retained when the transplantation was completed. . When the entire thickness of the bladder (which is here not covered by peritoneum) had been snipped through with scissors (or scalpel) blunt dissection was employed, and it was found not difficult to free the lower end of the ureter along the wall of the pelvis without injury to the peritoneum.

Both ureters having been isolated, the whole of the bladder tissue was remorselessly ablated, from the perimeter where it merged into the skin to the prostate where the vesiculæ seminales debouched.[1] The next step was to expose the lateral aspects of the rectum at a point below the reflection of the peritoneum. The deep dissection was found surprisingly easy. The final step was implantation of the ureters into the lateral wall of the rectum, which was accomplished in the following manner: With his finger in the rectum the operator carefully determines the exact point at which the implantation is to be made. The requisite qualifications are: (1) It must be above the internal sphincter; (2) it must be in the lateral and not in the anterior wall, so as to avoid kinking (this actually occurred in the first instance in the author's case, necessitating a subsequent adjustment of the implantation); (3) it must be high enough to permit the ureter to project slightly (one-fourth to one-half inch) into the lumen of the bowel without stretching. If the ureter thus projects it forms a papilla, which when pressed upon from within the bowel becomes converted into a valve similar to that present at entrance of the bile and salivary ducts. This point having been decided upon, the operator or his assistant passes a pair of slender forceps through the anus, presses them against it from the rectal aspect, and lifts it carefully into the anterior wound; the wall of the bowel is incised upon the projecting forceps, which are gently forced through. By stretching and cutting the wound is enlarged with great exactness, so the ureter with its contained catheter will accurately fill it and yet not be seriously pressed upon. The forceps are now opened, made to grasp the distal end of the catheter, and withdrawn into the bowel and out of the anus, the operator at the same time carefully directing the ureter through the slit, and satisfying himself that its termination forms a papilla at least one-fourth inch in length upon the rectal mucous surface. In guiding the mouth of the ureter through the slit in the rectal wall the forceps may be passed back again beside the catheter and made to grasp the edge of the rosette of bladder tissue around the ureteral papilla.

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[1]During this dissection great care must be exercised that the peritoneum be not exposed or injured; if its hazardous proximity be suspected, a portion of the bladder muscle may be left, though every vestige of its mucous membrane must be removed. In this case the peritoneum gave no trouble whatever and was never in the least jeopardized.

The same process is repeated on the other side. The sponge plug is withdrawn, care being taken not to disturb the catheter. There seems no necessity whatever for stitching the ureters in position.

The whole area to be healed will be found surprisingly small, and a firm packing with iodoform gauze will afford sufficient drainage and at the same time furnish support to the delicate ureters in their new position. When the implantation has healed securely and granulation has been established, a plastic closure may be done if it be deemed advisable.

The patient upon whom Peters operated was in perfect health when seen one and a half years after the rectum was converted into a cloaca by transplantation of the ureters. There was no evidence whatever of disturbance of the kidney function, and on examination per rectum the mouth of each ureter could be felt as a salient papilla as large as the tip of one's little finger.

Orloff (1902) performed Maydl's operation in four cases of exstrophy of the bladder. The first patient, a boy aged five years, had complete exstrophy, dilatation of the ureteral orifices, separation of the pubes of four centimeters, and double inguinal hernia. After implanting the vesical orifices of the ureters into the bowel the rectal sphincter was cut, and two large drainage-tubes passed into the rectum. The patient perished two years later of double pyelonephritis, in the meantime having been able to retain his urine during the day, but suffering nocturnal incontinence. The second patient, a boy aged seven years, was under observation for eighteen months after the operation, during which time he was able to retain his urine during the day. The third patient, a girl three years old, perished of peritonitis five days after the operation, probably due to incomplete suture (which could not be completed on account of the weakened state of the child). The fourth patient, twenty-four years old, perished from ascending infection less than three weeks after the operation.

Orloff collected fifty-six cases operated upon according to Maydl's method. In eleven cases death resulted within twenty-one days. Four perished from peritonitis, two from pneumonia, one from the anesthetic, and one from acute anemia. As to functional results, the operation caused no irritation of the intestine, and the anal sphincter remained competent. In some cases there was nocturnal incontinence. Only five of the forty-five patients who recovered from the operation perished from ascending infection, from which it would seem that this complication, invariable after the older forms of direct ureter transplantation, is the exception rather than the rule following Maydl's method.[1] The operation, however, is elaborate and time-consuming, requiring between two and three hours for its completion, and the postoperative period is subject to many complications, though exceptionally it runs a smooth course; but even under such circumstances renal colic and albuminuria have been noted. In seven instances fecal fistulæ developed, requiring a second operation for closure in three cases. In six cases pneumonia supervened, and in one there was phlebitis affecting the leg.

Recognizing that previous operations suggested for exstrophy possessed the disadvantage of not preventing incontinence of urine, and at the same time that implanting the ureters in the intestine exposed the kidneys to the risk of infection, Muscatello (1905) attempted to overcome these difficulties by a modification of Maydl's operation. A lateral anastomosis was made between the upper and lower ends of the sigmoid flexure and the free loop severed at its upper end, which was closed, as was the cut end of the sigmoid; this left an intestinal sac attached only at its lower end. A section of the bladder wall, including the orifices of the ureters and having at least one centimeter margin around them, was next dissected free and sutured into a longitudinal incision in the upper part of the free intestinal sac and covered with peritoneum. The free end of this sac was attached to the colon to prevent kinking; long rubber tubes were retained in the ureters during the operation; the abdominal wound was not entirely closed, drainage being permitted for four or five days. A case operated

[1] In this connection Halstead remarks that the mortality (Maydl's operation) as shown by the cases recorded, considering the gravity of the procedure, is surprisingly low. The long-continued anesthesia, the great shock, and the danger of peritoneal infection, all combine to make the immediate risk to life very great. The mortality is probably much higher than is indicated by the cases reported. As to the remote risks to life, there is undoubtedly great danger of infection of the kidneys even after the lapse of a year or more. In some cases the kidneys may be able to withstand the infection, as Peterson suggests, or death may in the end result from interstitial nephritis caused by a degree of infection not sufficiently intense to cause pyelitis or pyelonephrosis.

upon according to this method was said to have been entirely successful.

Halstead (1900) expresses the opinion that in all plastic operations for relief of exstrophy the final result is far from being good. In those cases in which the skin is employed in construction of the bladder, the hair growing from the vesical side of the flap leads to the deposit of lime salts, which ultimately causes symptoms which necessitate repeated operations for their relief. In any case the bladder never becomes a functionating organ, because of the lack of innervated tissue, consequently incontinence is the rule. It is also true that union of the flaps is difficult because of constant flow of urine interfering with the healing process. In the Trendelenburg operation, also in Koenig's modification thereof, septic infection of the wound occurs, and has been in not a few cases the cause of death. In closing his article Halstead remarks: "It may be said that up to the present time all the operations so far designed to restore the anterior wall of the bladder have been unsatisfactory, and that the condition of the patient is but slightly improved by any of these procedures."

Case I.—A female child seven years of age was brought to me fifteen years ago. In addition to a condition of complete exstrophy of the bladder there existed an immense prolapse of the rectum which hung down between the child's legs, and which was extensively excoriated and ulcerated. The infantile uterus was exposed, as was also the posterior vesical wall; the ureters constantly discharged urine on the surface, causing marked irritation, excoriation, and intense suffering.

About six inches of the prolapsed rectum was excised. The immediate result of the operation was good, so far as relief to the suffering caused by the prolapsed bowel was concerned; but subsequent consent to further efforts for relief could never be obtained.

Case II.—A young man aged seventeen years first consulted me in 1897. He had applied to a surgeon in St. Louis at one time, who said nothing in an operative way could be done which would be of benefit. He was brought to Louisville (1) to seek advice concerning a condition of complete bladder exstrophy, from which he suffered intensely; (2) if possible to obtain relief by operative measures; and (3) failing in this to procure a suitable urinal in the hope of making his future life more endurable.

He was fairly well developed for a boy of his age, though his general health had never been robust, and no abnormality existed save the epispadic exstrophy mentioned. He was in a pitiable state, and life had become practically unendurable as the result of extensive excoriations which had occurred from constant discharge of urine and contact of the clothing with the bulging posterior bladder wall. The prostate gland and the ducts of the seminal vesicles were plainly visible, and ulceration and deposit of calcareous material around the margins of the excoriation rendered the local condition extremely serious.

The epispadic penis was short and drawn back into a sulcus at the lower part of the opening; the posterior bladder wall with the discharging ureters presented a convex surface the size of half an orange, extending far in front of the abdominal plane, and when the patient assumed the recumbent or Trendelenburg position a concave sulcus of corresponding dimensions presented.

The initial plastic operation was performed on this patient a few days after his arrival in Louisville. The first step was to make a deep triangular incision each side of the abdominal defect, extending through the skin and cellular tissue, the apex being well out into the iliac region, and with forceps the integument was drawn upward and inward toward the center, bringing the mucous membrane at the margin of the defect along with the skin. When the tissues had been sufficiently loosened and stretched to permit the pudendal structures to be approximated in the median line, the edges down to the tip of the penis were vivified by splitting and brought together by two lines of sutures, one of buried chromicized catgut (No. 1) which inverted the inner or mucous membrane surface, the other of silkworm-gut which everted the outer or skin surface. Over this a dressing of collodion and cotton was applied; the buttonhole-like opening left above served to drain away the urine, the patient being required to maintain the Trendelenburg posture.

No especial good was apparently accomplished by this operation, except the

"piling up" of tissue, which proved of decided advantage during the next operative attempt.

Two and a half months afterward, all parts being perfectly healed and the resulting infiltration having disappeared, the flap-splitting and suturing as above outlined were repeated, the same lateral incisions being made. There was less tension to overcome, and it was gratifying to note when the sutures were removed on the tenth day thereafter that the penis had firmly united, and a fairly good bridge of tissue at the upper part of the pudendal portion of the operative site also held together.

Six months later the third plastic operation was undertaken. It consisted in closure of the transverse aperture at the upper part of the original open space, which was accomplished by freshening the edges of the bridge of tissue and the line of skin above by splitting, the former method of union being employed, except that both lines of sutures were of chromicized catgut and both were buried. This healed from end to end, leaving a round space about the size of a silver quarter between the lower edge of the bridge of tissue described and the root of the penis, which still remained uncovered.

The improved condition of the patient by this time encouraged great hope of final success, but four additional attempts (making seven in all) were necessary, extending over another year, before the desired result was attained. These last operations consisted in splitting the edges of the opening and suturing, and each was followed by a decrease in the uncovered area. The last step in the operation was completed just two years after the first, and the result was perfect.

The new bladder has since performed its function, and is in a perfectly healthy condition. The penis has developed considerably. The young man has been able to fulfil the duties of salesman in a store, he can keep himself dry, and is altogether comfortable and happy. While recumbent about four ounces of urine will accumulate, and when he rises this can be voided through the urethra with some degree of force by voluntary effort. When upright the urine is received into an ordinary urinal.

The foregoing case was briefly reported and the patient exhibited before the Surgical Section of the American Medical Association in 1900.[1] At that time Kelly, of Baltimore, said that the only operation to be done with certainty of immediate success was to put the ureters (with the neighboring portion of the bladder) into the rectum according to the method of Maydl *et al.* He admitted, however, as did all the others who saw the patient, that the condition presented was remarkable, that the result obtained was marvelous, and did the operator great credit. After having tested the methods hitherto advocated Kelly expressed his preference for that of Sonnenburg, to which reference has already been made.

Means, of Columbus, was of the opinion that all plastic operations (for exstrophy) were only palliative, and of all methods there was none equal to that of Maydl. He referred to a case in which he had employed the double-skin-flap operation, which proved only partially successful.

Eastman, of Indianapolis, referred to a case in which he successfully transplanted the ureter from the right kidney (the left kidney having previously been removed) at the tip of the clubbed epispadic penis, which was split in the median sagittal line for reception of the ureter.

Summers, of Omaha, said he had operated upon four patients for exstrophy. In the first three he had employed the "old-time" plastic methods, which proved unsatisfactory. In the fourth case, a female, little trouble was experienced in fixing the ureters in the vagina.

Willard, of Philadelphia, believed that the formation of an intestinal reservoir was preferable to any of the other methods suggested.

CASE III was a boy aged seven years, and the conditions present differed in no essential respect (except the age of the patient) from those in Case 2. He was operated upon three times by the flap-splitting and suture method, as already described, and the result gave every promise of being as successful as that obtained in Case 2; but the child was permitted to go home on a visit and never returned. The subsequent history is unknown.

In nearly thirty years of active surgical practice the writer has only encountered these three reported cases of exstrophy

[1] See *Journal of the American Medical Association*, Dec. 29, 1900.

which submitted to operation. He is reasonably familiar with the various operations which have from time to time been advocated, and as referred to in the foregoing epitome of the literature, and based upon observation and experience he still adheres to the opinion frequently expressed in the past, viz., that more satisfactory ultimate results may be expected to accrue in these unfortunate cases from plastic operations than from radical procedures which involve implantation (or transplantation) of the ureters into the sigmoid flexure, the perineum, the rectum, or elsewhere. Of course it is recognized that an entirely successful issue cannot be positively promised under any circumstances, no matter what may be the operative procedure undertaken. From evidence thus far adduced, however, the statement seems warranted that in the majority of cases (because of immediate and subsequent dangers to life) the Maydl and other radical methods are very hazardous in the hands of the rank and file of surgeons, and that preference should be given those plastic procedures which have for their ultimate object the construction of an artificial bladder (or receptacle for accumulating the urine), although repeated operative steps may be required to insure a permanently successful and satisfactory outcome. The writer is not unmindful of the fact that this is not in accord with the expressed views of other and perhaps more eminent authorities, the majority of whom advocate and practice the Maydl operation or some modification thereof, but it is his firm conviction after giving due consideration to all the methods thus far suggested.

In the performance of plastic operations for the cure of exstrophy much patience is required on the part of both patient and surgeon, and many difficulties must be overcome. The surroundings are septic, and conditions not infrequently develop which are antagonistic to perfect surgical work. It is oftentimes difficult to draw away the urine, and constant lack of rest of the parts involved due to the tendency to erections constitutes another difficulty which must be overcome. Notwithstanding all these, however, the results which can be thereby secured certainly justify the employment of autoplastic procedures. It is important that no hair-bearing tissue be introduced into the artificial bladder, otherwise secondary operation may be required for liberation of calcareous deposits which may take place. The best results can be promised from plastic procedures if these be undertaken before the child has reached the age of ten years.

NOTE.—In collecting and epitomizing the data for this paper the writer has necessarily abstracted freely from the work of others, and it is desired that full credit be extended to both authors and publishers for the material so excerpted and utilized. He wishes to especially acknowledge his indebtedness to an admirable article from the pen of Halstead published in *Medicine* (1900) for several citations from the literature. A partial list of additional references is appended hereto. Where it so happens that the original contribution appeared in a foreign journal and was abstracted by an American publication, the latter is given as reference.

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COMPARISON OF THE PHARMACOLOGIC ACTIVITY OF THE FLUID EXTRACT OF SQUILL PREPARED ACCORDING TO THE UNITED STATES PHARMACOPŒIA, 1890 AND 1900.

From the results reported by HOUGHTON (*Journal of the American Medical Association,* May 12, 1906) it may be concluded that acetic acid is not so satisfactory a menstruum as alcohol for making a fluid extract of squill. The therapeutic results obtained from the use of fluid extract of squill (United States Pharmacopœia, 1900) will be variable and considerably less than would be expected from the use of the 1890 preparation. It would seem desirable that physicians in prescribing squill should indicate that they desire the preparation of the United States Pharmacopœia, 1890, when they wish to obtain the usual therapeutic action of squill.

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EDITED BY
H. A. HARE, M.D.,
GENERAL THERAPEUTICS,
AND
EDWARD MARTIN, M.D.,
SURGICAL AND GENITO-URINARY THERAPEUTICS.

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Leading Articles.

THE TREATMENT OF PULMONARY EDEMA.

At a recent meeting of the Association of American Physicians in Washington an interesting paper upon the pathology and treatment of pulmonary edema was contributed by Dr. Reisman, of Philadelphia. It provoked a more exhaustive discussion than that which was accorded to any other communication. Of the remedies which have been found to be most useful in this condition, it would appear from the discussion that atropine, strychnine, morphine, and adrenalin had acquired the greatest confidence of practitioners. But as was pointed out by Dr. Meltzer, of New York, the employment of adrenalin in pulmonary edema, even if it seemed successful in certain cases, cannot depend upon a rational basis for its employment. When injected into the circulation directly, or when given subcutaneously, adrenalin stimulates the peripheral blood-vessels and raises arterial pressure throughout the systemic circulation. It does not produce a similar constriction of the blood-vessels in the lung, and therefore tends to increase the pulmonary engorgement by causing the blood to pass from the high pressure of the systemic circulation to the low pressure of the pulmonary vessels. Basing his opinion upon these facts, Dr. Meltzer strongly urged his colleagues to resort to a plan of treatment diametrically opposed to that just mentioned, and to use hypodermic injections of nitroglycerin, which, by relaxing the blood-vessels of the general system, would tend to diminish pulmonary congestion. This recommendation is the more interesting in view of the facts which have been recently adduced from the clinical standpoint to prove that nitroglycerin, by reason of its vascular influence, is perhaps the best drug that we can employ in cases of hemoptysis, since its use diminishes the flow of blood to the lungs. It is evident that pulmonary edema cannot be recognized as a distinct entity, but rather must be viewed as a pathological condition which depends upon a number of causes. In some instances it would appear to be due to a feeble right heart; in others to an overdistended left auricle and left ventricle; in still others it is a manifestation of toxemia due to renal disease or to some other cause which results in autointoxication. It may arise from the inhalation of irritant gases, and it may be associated with symptoms which closely resemble angina pectoris.

The fact that pulmonary edema is a symptom rather than a disease, and that its causes may be so very varied, is doubtless an explanation for the varying degrees of success which have followed the employment of different drugs. It also explains why some cases are hopeless from the start, and others respond fairly rapidly to active treatment. Again, we must bear in mind that pulmonary edema may be a slowly oncoming condition, or, on the other hand, may develop with remarkable rapidity, so that in the space of five or ten minutes a person whose respiratory organs are apparently in perfect health may become almost suffocated, and a free flow of bloody serum may take place from the mouth and nose. It is rather remarkable in these cases that the degree of cyanosis is not more severe.

That the cases in some instances are neurotic in origin, or at least depend upon toxic substances which influence the blood-supply of the lungs, would seem to be indicated by the experience of investi-

gators and clinicians. Thus, no less eminent a practitioner than Dr. Janeway, of New York, in describing cases of this character which had been under his care, stated that he had seen pulmonary edema not infrequently associated or followed by profuse sweating and purging and excessive diuresis.

In urgent cases of pulmonary edema in which the physician may be called upon to exercise his greatest skill at a moment's notice, it seems to be the consensus of opinion that morphine and nitroglycerin should be freely given.

At first glance the employment of strychnine simultaneously with, or soon after, the nitroglycerin seems somewhat contradictory, because of the possibility of its acting as a vascular stimulant, and thereby opposing nitroglycerin. On the other hand, its use may be advisable, and when it does good the benefit probably accrues from its action as a cardiac stimulant, and not by any effect which it may exercise upon the blood-vessels. In the cases of pulmonary edema which develop more gradually, and in which the general arterial tension is quite low, atropine may be freely administered, even as much as 1/25 of a grain being given, and strychnine may also be used.

The writer of this editorial, toward the end of the discussion which has been spoken of, pointed out not only that pulmonary edema is a symptom rather than a disease, but also insisted upon the fact that the treatment must depend upon a careful study of the patient's general condition. In those cases in which arterial spasm is present, nitroglycerin is probably invaluable; whereas in those instances where the arterial tension is abnormally low, nitroglycerin would seem to be contraindicated, and atropine and strychnine would appear to be the remedies of choice.

THE TREATMENT OF HEMOPTYSIS.

There are few conditions which demand more active treatment than this complication of pulmonary tuberculosis, and there is probably no condition in which the physician is so powerless to accomplish much by the administration of drugs. If the vessel which is ruptured is of any considerable size, it is inconceivable that any drug given by inhalation or the hypodermic needle, or by the mouth, can hurry the development of the clot which is necessary to control the leak. The most that the physician can do is to relieve nervous excitement and arrest the cough, which may disturb a forming clot, by the hypodermic injection of an adequate dose of morphine, by insisting that the patient shall remain at rest, and by the administration of drugs which diminish blood-pressure in the general system, and so indirectly modify or diminish the supply of blood to the lung. As we have already pointed out when dealing with the subject of hemorrhage from the bowel in typhoid fever, few physicians of experience would hope to control bleeding from a branch of the anterior tibial artery by the internal administration of styptics or vasoconstrictors, and they would feel fully assured that the only method to employ was a compress or ligation. The same facts hold true in regard to hemoptysis, yet in a very considerable number of instances physicians are in the habit of administering stimulants to patients who have suffered, or are suffering, from hemoptysis, and in the majority of cases this plan is irrational, since it increases the quantity of blood which goes through the lung.

Many years ago we published in the original columns of the GAZETTE an address in which we urged the employment of aconite or chloral as vascular and nervous sedatives in this condition. Unless the patient is very feeble, we still believe that they are useful. The use of strychnine and adrenalin as vascular stimulants is unwise, unless there is some additional indication for their use. Within the last few months a number of observers in France and England have strongly urged the employment of vasodilators in the treatment of this condition, and in particular Pit and Petitjean have written upon this subject, carrying out an original research in regard to the influence of the drugs in controlling hemorrhage of the lungs. They found, for example, that the various circulatory stimulants and constrictors had no influence along these lines, but they assert that the inhalation of nitrite of amyl results in a dilatation of the blood-vessels of the general system and in actual constriction of the vessels of the lung. Thus, if the lung in animals is exposed, and nitrite of amyl is administered, its tissue is seen to become blanched simultaneously with the fall in the sys-

temic arterial pressure which this drug produces.

In instances in which nitrite of amyl is not at hand, or in which it is considered inadvisable to administer such a rapidly-acting and somewhat alarming remedy, similar results can be obtained by the hypodermic injection of nitroglycerin in the dose of about 1/50 of a grain or more.

THE CURATIVE EFFECTS OF REPEATED PARACENTESIS ABDOMINIS.

Ascites in adults is without doubt due, in the majority of instances, to hepatic cirrhosis, a condition which in itself is certainly incurable, although a change in the patient's method of life and the administration of the iodides may for a long time, perhaps permanently, arrest the process, even if they cannot overcome the lesions which have already been produced. Many of the associated symptoms of cirrhosis can, however, be treated with success, and ascites is one of them. Physicians who have large hospital experience have known for many years that repeated tapping and drawing off of the ascitic fluid in some cases results in a gradual decrease in the speed of its reaccumulation until a cure results. In one case under the writer's care the patient was tapped about sixteen times, and since then has not had any return of fluid for nearly ten years. Another patient who had various tappings, and who gave vent to something like 500 gallons of fluid, now requires tapping only once in several months, and similar instances of a corresponding nature might be cited in addition. The London *Lancet* of April 21, 1906, contains a report of a case which was tapped sixty-nine times, about two gallons of fluid being removed each time; and Dickinson, of the United States navy, recorded another instance in which a patient, twenty-eight years old, was tapped sixty-nine times in seventeen months. The *Lancet* also cites the case of Haymaker and Graham, which was tapped 130 times within eighteen years; but the most extraordinary of all these instances is that of a woman reported by Cann, who was tapped 886 times in fifteen years, or about once a week for the whole time. When we calculate the quantity of fluid removed in a case of this kind, the figures become stupendous. In one case of Paolo, the quantity of fluid which was removed was fifty times the weight of the patient. In Cann's case 886 tappings removed three tons of serum. These instances do not illustrate the curative effect of tapping upon cirrhosis in the sense that the patient is relieved of abdominal distention permanently, but they indicate that the removal of the fluid is capable of prolonging life not only by relieving the pressure, but also indirectly by enabling a collateral circulation to be established, which in some instances may prevent the further accumulation of liquid.

SOME POINTS IN THE SURGERY OF THE LUNG.

All observations of Macewen are of importance not only because of the ripe surgical judgment that even his earlier papers foreshadowed, but because of the enormous experience which both his hospital and private practice has given him. In delivering the Cavendish lecture "On Some Points on the Surgery of the Lung" he has chosen a topic not yet thoroughly systematized, and one in which few individual surgeons have a large experience.

He first considers that bugbear of the surgeon, collapse of the lung, which is believed to be an inevitable sequel of any wound, unless the costal and parietal pleuræ are adherent. In confutation, Macewen quotes a case which led him to doubt the inevitability of this complication. He noted in this case that a partial collapse of the lung incident to manipulation needful, in one instance, for checking of hemorrhage, and in the other for the extraction of a knife-blade buried in the lung substance, disappeared promptly after bringing the costal and visceral layers in contact by firm pressure on the chest wall, and thereafter these two layers remained in contact and the expanded lung was brought to the aperture, where it lay in contact with the external atmosphere. This experience he states has been many times repeated when operating because of penetrating wounds of the pleura, the lungs, and the mediastinum.

In contrast to this case he notes an instance of traumatic pneumothorax incident to a simple fracture of the rib, relieved three times by the emergency treatment of aspiration. Macewen cut down upon the broken bone, removed a fragment of the rib which had been fractured,

emptied the pleural cavity of blood and air and by vigorous compression of the chest walls, thus bringing the parietal pleura in contact with the visceral layer, closed the wound in the lung, and lightly packed the thoracic opening, which was thus kept open, that any air which might come from the lung could escape externally. Firm pressure was maintained on the external thoracic wall above and below the wound in the thorax by means of adhesive plaster, applied as for broken ribs, and over this a firm roller bandage was placed. The patient recovered promptly.

In two other cases of wounded lung with pneumothorax and threatened death from suffocation, the same treatment was satisfactorily followed. In one instance there was great difficulty in causing the lung to expand sufficiently for its investment to come in contact with the parietal pleura. This was finally managed by combining pressure directly on the chest and upward through the diaphragm with expanding efforts made by the patient himself, who attempted to cough with his mouth and nose closed. Thus the two pleural layers were brought together, and this was followed by expansion of the lung, which remained in this condition.

Macewen holds that persistent pneumothorax causes either drying of the serous surface or an alteration in its exudate which lessens its capillary and cohesive power, hence if pulmonary collapse is threatened he would open the thorax, close the wound in the lung by suture, and then by pressure would bring the two pleural layers together. The parietal opening should be placed just over the lung wound, and should be kept open until the lung is healed. This method of expanding the lung Macewen has used since 1875, in all cases in which he has removed tumors of the thoracic parietes. He has always been successful where the pleural surfaces were in approximately normal condition.

Macewen insists upon his teaching that full expansion of the lung is maintained by the molecular cohesion existing between the two serous surfaces of the pleura and the capillary attraction exercised by the thin layer of serous fluid lying between the two moist membranes. When this molecular cohesion is removed collapse of the lung occurs, owing to the elasticity inherent in the pulmonary tissues. Total collapse he holds does not occur from atmospheric pressure.

When air is admitted into the pleural sac the effect on respiration will depend on the condition of the other lung and its pleura. If the opposite lung is normal and in full functional activity, and its pleural and mediastinal connections are intact, the opening of one pleura will produce no serious effect on the respiratory and circulatory function as a whole.

The effect of the admission of air into the sac will be modified somewhat by the position in which the patient is placed at the time of operation. If he be lying upon the sound side the compression of that side is greatly increased by the action of gravity, which throws the weight of the heart and blood-vessels upon the sound side and prevents the mediastinum from aiding in the fixation and expansion of the sound lung. If the patient is turned on the affected side the gravity action greatly favors the apposition of the lung to the chest wall on that side, thus limiting the amount of air which enters the pleural sac and aiding in fixing the mediastinum and in expanding the sound lung and enabling it to perform its increased function. In some cases in which in the course of operation the pleura has become dry by a prolonged exposure, it is moistened by a saline solution as a means of increasing its cohesive properties. The comparative rarity of pneumothorax as a complication of fracture of the ribs is explained by Macewen on the basis of this cohesion.

The shock which nearly always accompanies cases of sudden entrance of air into the pleural sac is attributed to the effect upon the heart, which suffers from the loss of the accustomed support, and from back pressure incident to the arrest of pulmonary circulation. The mediastinal pleura is extremely thin and may be opened into the pleural sac of the opposite side as a result of slight trauma.

In removing the lung Macewen advises to go wide of the hilum, and thus avoid wounds of the pleural covering of the mediastinum or of the phrenic and vagus nerves. He also urges that both the parietal and visceral layer of the pleura at the apex of the lung should be allowed to remain if attached, since here it is in intimate relation with the subclavian artery and sometimes the brachial plexus. He advises that the ribs to which the diaphragm is attached should be preserved

if possible, since all the attachments of this muscular plane are essential to proper function.

Macewen quotes an illustrative case, vigorous and working eleven years after operation, in which he removed the remains of a tuberculous, degenerated left lung, and after a series of rib resections closed entirely the resulting wound.

SAUERBRUCH'S OPERATIVE CHAMBER.

Although the tendency of the day on the part of surgeons most skilled in their art is toward simplification not only of technique but of tools, there are some devices which so greatly facilitate the performance of certain operations that they bid fair to be generally adopted. As to whether Sauerbruch's operative chamber can be ranked in this category remains yet to be demonstrated.

In the *American Journal of the Medical Sciences* for July, 1906, Hahn gives an interesting sketch of the development of this chamber, suggested by Mikulicz in the hope that thoracic surgery might be modified by the devising of an arrangement by which the lung could be prevented from collapsing after opening the thorax. If the doctrine be accepted that the lungs can operate only so long as the pleural cavity remains closed and air-tight, and the moment this cavity is opened the elasticity of the lung will cause it to collapse, it follows that this collapse may be prevented either by producing within the lung an increased pressure, or without the lung and about the open thoracic wall a decreased pressure. This latter end has been attained by Sauerbruch by the construction of a cabinet or box which contains rarefied air. The cabinet finally constructed is of sufficient size for the surgeon and his assistant, together with the body of the patient, whose head projects through an aperture protected by rubber tissue. To overcome the effect of venous congestion the patient's body is swathed in a rubber sack which communicates with the outer air and makes peripheral pressure upon the patient's body. The anesthetist sits outside the cabinet and administers ether. The rubber cut-off fastened around the neck is so adjusted that it makes no undue pressure. By means of a telephone the person administering ether can communicate with the surgeon, who is within the cabinet. As a result of negative pressure the operator and his assistants sweat profusely, but Hahn states that after spending two hours under a negative pressure of 2 millimeters of mercury he experienced no ill effects.

As to the results obtained by the use of this cabinet Hahn particularly mentions the esophageal work. Although it was perfectly easy to expose the esophagus without collapsing the lung, this procedure caused a great deal of shock. Also, it frequently happened that carcinoma of the esophagus was quite inoperable, and occasionally infection and empyema followed. Hahn mentions one case of malignant involvement of the esophagus first treated by the establishment of a stomach fistula through which nourishment was given. The esophagoscope showed a small, circumscribed tumor, which proved microscopically to be an epithelioma. It seemed entirely suited for operation, yet very soon after opening the pleural cavity and the displacement of the lung the patient became dyspneic and pulseless, and shortly died. Preoperative injections of nuclein were used here to produce a hyperleucocytosis. This occasioned an unfavorable reaction even before operation.

In two other cases subject to operation the tumor was found to be inoperable after opening the chest. These both died from pleurisy.

Mikulicz's method of operating was to perform a thoracentesis in the fourth intercostal space through a long incision running parallel with the ribs. The wound was then forced open widely by tearing the edges apart by means of an automatic retractor. Even after the excision of a portion of the esophagus the approximation of the healthy ends by suture is universally unsuccessful. Sauerbruch has, however, obtained good results by the use of the Murphy button at least in animal experimentation.

Several cases of gangrene of the lung were operated on with good results. There was also one satisfactory case of bronchial fistula, and one case of wound of the heart, which the recorder naively states would have recovered excepting that he bled to death during operation. He notes, however, that the lungs expanded very beautifully after removal of the ribs and opening of the pericardium.

Reports on Therapeutic Progress

ADVICE FOR TUBERCULOUS PATIENTS.

The *Journal of the Outdoor Life* for May, 1906, quotes the following from the recommendations of the Bellevue Hospital of New York:

Bathe regularly. Sponge your chest with cold water every morning.

Rest. Avoid all unnecessary exertion. Do not walk more than you are allowed. Sleep at least eight hours every night, and go to bed early. Never run; never get out of breath. Never lift heavy weights; never get tired. If you have to work, take every chance to rest that you can. Go slow.

Food. Eat plenty of good, wholesome food. Drink at least one quart of milk a day. Eat from three to six eggs a day, and take them raw if you possibly can. Eat slowly; avoid anything which causes indigestion. Keep your bowels regular. Do not drink liquor, wine, or beer. Do not smoke.

Medicine. Take no medicine without your physician's advice. Stop any medicine which upsets the stomach. Report regularly to your physician. Report immediately if you have indigestion, diarrhea, constipation, pain, increased cough, or hemorrhage.

Follow instructions carefully and exactly, and your chances of getting well will be increased ten times.

THE COMPOSITION OF SOME CANCER "REMEDIES."

The *British Medical Journal* of May 26, 1906, tells us that a very slight acquaintance with the advertisements of quack medicines which are so abundant in newspapers and periodicals is enough to show that a knowledge of the causes of the diseases for which a cure is promised is in no wise necessary for the composition of either the medicine or the advertisement; in fact, it is impossible to believe that the extravagant claims and absurd statements made could be put forward by persons having a knowledge of the subject. It is no matter for surprise, therefore, that in the case of the least understood and least successfully combated of diseases many proprietary "remedies" are put forward. A considerable number of these articles have been received and the alleged claims tested at the laboratories of the Imperial Cancer Research Fund; a few of those received have been sent by Dr. Bashford, the director of the laboratories, and some notes on the composition of these, as revealed by analysis, cannot fail to be of interest to members of the profession, who will probably from time to time have to treat sufferers from cancer who have been induced to buy one or other of these preparations.

As was to be expected, the articles examined have little or nothing in common. In the case of diseases for which the ordinary treatment involves the use of certain specific drugs, proprietary medicines are usually merely varying compounds of those drugs; thus, of the advertised cures for epilepsy, analyses of which the *British Medical Journal* published not long ago, all but one consist essentially of bromides. But in the case of cancer the would-be maker of a proprietary "cure" has no such accepted treatment to guide him, or restrict the free range of his fancy in selection of ingredients; it is probable that some of the "remedies" here described were inspired by improvement having apparently followed their fortuitous use in some cases, *post hoc* having been regarded as *propter hoc;* the first to be described, however, can hardly rest even on this basis.

It is a colorless liquid, containing a trace of sediment; the odor is that of alcohol, though very slightly vinous. Fractional distillation showed the presence of about 40 per cent of alcohol; on complete evaporation a trace (0.02 per cent) of dry residue was left. This residue was free from any alkaloid, and its behavior with reagents gave no indication of any other active principle; it agreed in character with the "extractive" found in spirit that has been kept in a wine-cask. After removing the alcohol the liquid was perfectly tasteless. This "remedy" is thus very simple in nature, consisting merely of diluted and slightly impure alcohol. Its composition brings to mind the analysis published some years ago of a so-called electric fluid, or "electricity," for the cure of cancer, which was taken up by a certain well-known journalist and boomed by him in the pages of the review which he edited; many marvelous cures

were ascribed to it, but examination showed that it consisted of plain water, sold at several shillings per fluidounce. Notwithstanding the exposure the article is at present quoted in wholesale lists, and is therefore presumably still in demand. The cost of the "medicine" in question is of course considerably greater than the cost of plain water, but this fact will be but small consolation to the victim who derives as little benefit from the one as the other.

The next of the articles analyzed was a blue fluid containing a considerable blue sediment, and smelling fairly strongly of terebene. The chief ingredient here was found to be a blue dye-stuff of the oxazine or thiasine group, much resembling methylene blue (which is the only member of these groups ordinarily used in medicine), but differing from it in solubility and in its behavior with certain reagents. This constituted the greater part of the sediment, and a portion of the dye was also in solution. The liquid further contained a dissolved gum and a trace of terebene; these, with a little magnesium carbonate, were all the ingredients present. No trace of any alkaloid was found, and the solvent was water. The gum showed no difference from ordinary acacia gum, and was probably added to suspend the undissolved dye-stuff. Water dissolves very little terebene, and no more of the latter was present than could be dissolved by the water; it was probably employed to give an aromatic taste and smell, and the magnesia was doubtless used to subdivide the terebene in the manner commonly followed when dissolving essential oils in water. It thus appears that the essential ingredient of this medicine is the blue dye-stuff; it is possible that this has been used as methylene blue, since the articles sent out under the same name by different dye manufacturers often differ in composition; but, as already stated, it is not identical with the methylene blue usually met with. The total solids in the mixture, after shaking up the sediment, amounted to 13.2 per cent, of which the dye-stuff constituted something like one-half.

The third preparation was a brown liquid of syrupy consistence, found to consist of wood tar. It was a much purer product than ordinary Stockholm tar, and its peculiar odor indicated that it was derived, at least in great part, from the birch; no other ingredient could be found. This article came from Sphakia, Crete; the label bore no directions for its use, leaving it uncertain whether it is intended for internal or external use, but the latter appears the more probable.

The remaining articles are clearly intended for external application; the first of these consisted of a plaster mass, in the half-pound sticks in which such masses are usually supplied. Analysis showed the principal ingredient to be lead oleate, with a little stearate, and small quantities of resin and soap. These are the ingredients of the official plasters emplastrum resinæ and emplastrum saponis; the proportion of soap present showed the specimen under examination to be emplastrum resinæ.

The next preparation was an ointment of Dutch origin. It contained large quantities of ammonium alum and zinc sulphate, with a little sodium sulphate, made up into a stiff ointment with a basis consisting of beeswax, soft paraffin, oil, and resin. The quantities of the salts were approximately:

Alum	27 per cent.
Zinc sulphate	37 per cent.
Sodium sulphate	8 per cent.

The presence of this large proportion of mineral salts, of course, leaves very little tenacity in the ointment; particles of the white salts were easily visible to the eye, and the effect of applying the preparation must be practically the same as if the dry salts were rubbed on the skin, except that the basis would, of course, act as a lubricant in the rubbing.

The last of these preparations was another ointment; the mineral ingredients in this case, however, were in the organic combination. This ointment contained copper oleate and aluminum oleate with a basis of lard and a little resin. The proportions of the active ingredients were approximately:

Copper oleate	15 per cent.
Aluminum oleate	35 per cent.

No alkaloid or other active principle was found.

In addition to the above specimens received from Dr. Bashford, a bottle of lotion for cancer and other affections, obtained in the ordinary way through a dealer, was examined. The label commences with the statement that the lotion

"cures cancerous or malignant sores;" then follows a list of other diseases, with the addition, "even cases that have been under the treatment of doctors and at infirmaries for years." Analysis showed the composition of the lotion to be substantially as follows:

Zinc sulphate, 92 grains;
Carbolic acid (pure phenol), 1.2 ounces;
Glycerin, 1.8 fluidounces;
Cochineal solution, sufficient to give a deep-red color;
Water to 3.3 fluidounces.

This quantity is contained in a bottle costing 4s. 6d.; the directions are to add the whole contents to 1½ pints of water, and apply to the diseased parts for about five minutes, two or three times a day.

THE TREATMENT OF HYPEREMESIS GRAVIDARUM.

In the *New York State Journal of Medicine* for May, 1906, STONE tells us that the treatment of hyperemesis gravidarum, considered specifically, should consist of: (1) Rest in bed, absolute in most instances, at least for a few days. (2) Exclusion of all visitors, even members of the family in severe cases. (3) A milk or broth diet, or absolute withdrawal of all food by stomach in the severe cases, but a liberal allowance of water. (4) Catharsis at the beginning of treatment with calomel and salines, the salines sometimes to be repeated. (5) Colon irrigations with normal saline solution, or rectal injections of the same. Intravenous infusions in the severest types. (6) Nutrient enemata. (7) Administrations of a few doses of opium, well selected as to time, either hypodermically or by rectum. The writer considers the opium a valuable adjunct, and does not think that the beneficial results following its use offer any more argument against the toxic origin of the disease than do the good results of its use in other toxic conditions.

It may be truthfully urged that a nurse is required for the proper administration of such treatment, which financial considerations may render impossible. A more general teaching, however, that the early treatment of this complication is necessary will soon bring to the hospitals a large number of such cases, by means of which not only immediate advantage will result for the patients, but also a greater opportunity and responsibility will be furnished for the hospitals to pursue some scientific investigations in the metabolism of pregnancy, a provision for which is not made by any maternity hospital in New York City at the present time.

In the treatment of the severe cases, particularly those of the acute or fulminating type, the additional evidence furnished by a complete chemical examination of the urine will give the most accurate knowledge of the gravity of the condition, although as yet the appearance of no single pathological constituent can be said to furnish an infallible guide. The writer believes, however, it will be possible to decide in a larger number of cases than formerly whether the treatment as outlined above shall be continued, or whether pregnancy shall be terminated.

In the presence of urinary changes that denote a serious disturbance of metabolism it is the writer's own opinion that pregnancy should be terminated at a much earlier period than any text-book has so far suggested.

The choice of method in terminating the pregnancy may also be of the greatest importance. Rapid dilatation and emptying the uterus under a general anesthetic is a serious operation in these cases, and should not always be attempted, because the shock may be the determining factor in a fatal result. No one can tell, either, when the uterus is completely emptied, because it is practically impossible to introduce a finger into the uterus, unless more time is taken for dilatation than is usually considered desirable. An experience of the writer in a previously reported case, in which the vomiting did not cease until after the removal of some portions of the placenta that had been overlooked at the first operation, illustrates the importance of this point. If it does seem necessary to use anesthesia, the writer would advise the use of ether instead of chloroform, because the evidence is accumulating that chloroform is particularly dangerous in the presence of marked disturbances of metabolism.

It must be confessed that a perfectly safe and efficient method of accomplishing rapid dilatation without anesthesia has not been found. Sinclair gives a recent review and commentary of the discussion in the congress of the German

Gynecological Society, held at Kiel, June, 1905, upon the methods of artificially dilating the pregnant and parturient uterus. In this discussion Leopold recommends the use, in the early months, of laminaria tents when the completely intact uterus, in the absence of pains and hemorrhage, has to be emptied. Sinclair in his comments also very earnestly advocates their use, stating that they may be rendered aseptic more easily than steel instruments. At the risk of criticism the present writer would suggest that their use in the class of cases under discussion might be an ideal method of interrupting the pregnancy. This suggestion is made with a keen appreciation that their use has practically been discarded by the best men in this country, but, as suggested recently by a friend, it may be that at the time they were in general use they might have been the scapegoat for the technical errors in asepsis that were then more frequent than at the present time.

THE TREATMENT OF PRURIGO, PRURITUS, AND SOME COMMON ITCHING DERMATOSES.

ORMSBY considers in the *Journal of the American Medical Association* of May 26, 1906, only the treatment which he thinks has positively proved of value in pruritus, deeming it unnecessary to consider that of prurigo, and only mentioning that of scabies.

Scabies.—Sulphur stands at the head of the list of remedial agents in the treatment of scabies, but on account of its disagreeable odor when used in an ointment, and its liability to produce dermatitis, its otherwise universal use is somewhat restricted. It may be employed in the following formula:

℞ Sulphuris sublimat., ʒij-ʒj;
Adipis benzoinat.,
Unguenti petrolat., ää ʒjss.

M. Ft. unguentum. To overcome the odor balsam of Peru may be added in the same quantity as the sulphur.

Karosi recommends the following, which is reliable and has no odor and is not so likely to irritate:

℞ Naphthol, ʒiv;
Cretæ preparatæ, ʒijss;
Saponis mollis, ʒjss;
Adipis, ʒiij.

M. Ft. unguentum.

In any case the patient should begin the treatment with a warm bath of about thirty minutes' duration, during which the surface is thoroughly shampooed with either green or Castile soap. In this way the furrows are opened to allow the medicament to come in closer contact with the active cause. The ointment should be used daily for three or six days, which is usually sufficient to eradicate all activity of the disorder. Should a few areas escape they may be treated later with the ointment. It is necessary to sterilize the undergarments and bedclothing by boiling and the outer clothing by baking to prevent reinfection of the patient. Sherwell recommends using dry powdered sulphur, rubbed lightly over the surface after bathing, once in two or three days, changing the undergarments and bed linen each time, also having the sulphur sprinkled between the sheets. This method is of distinct value in many cases, is clean, and requires one or two weeks to eradicate the disease. One or the other of these three simple formulæ will accomplish the result in all cases. The dermatitis arising from the sulphur in ointment form will soon clear up on suspension of the drug, and using in its place a simple dusting powder, such as the compound stearate of zinc.

Pruritus Essentialis.—The treatment of any case of pruritus is simple if the etiology is clear. In many cases this cannot be absolutely determined, and then recourse to some of the general rules laid down must be resorted to. There are some general principles of treatment, both as to internal and local management, which are of great value, both in mitigating and completely relieving the disease. As a rule constitutional treatment is unsatisfactory unless especially directed to some discoverable etiologic factor, such as diabetes, rheumatism, or the various other hepatic and renal diseases concerned in its production. Among other constitutional remedies should be mentioned cannabis indica, gelsemium, pilocarpine, belladonna, quinine, the salicylates (acetyl-salicylic acid), phenacetine, antipyrin, chloral, sulphonal, arsenic, and chloride of calcium, as recommended by Savill. Local remedial agents are very important, and if properly selected and applied are of great value. The best of these are carbolic acid in oil or lotion; thymol, or menthol, 1 to 4 per cent in an ointment; resorcin, ½ to 2 per cent in

lotion; camphor in an ointment or dusting powder; chloral in an ointment or lotion, and the tars; also hot water, electricity, and radiotherapy. These local remedies may be used in the following combinations:

℞ Acidi carbolici, 3j-iij;
Aquæ calcis,
Olei olivæ, ää f℥viij.

Or,

℞ Acidi carbolici, f℥ss-jss;
Pulv. amyli, 3ij;
Pulv. zinci oxidi, 3iij;
Aquæ calcis, f℥jv;
Aquæ rosæ, q. s. ad f℥xvj.

Or,

℞ Thymol vel menthol, gr. v-xxj;
Adipis Lanæ,
Unguenti petrolati, ää ℥ss.

Or,

℞ Resorcin, gr. xv-3j;
Glycerini, f3jss;
Spts. vin. rect., q. s. ad f℥viij.

Or,

℞ Camphoræ or chlorali, 3ss-j;
Unguenti petrolat., ℥j.

Or Anderson's dusting powder:

℞ Pulv. camphoræ, 3jss;
Pulv. amyli, 3viij;
Pulv. zinci oxidi, 3jv.

Or Wilkinson's salve:

℞ Olei rusci (birch tar), 3ij;
Sulphuris sublimat., 3ij;
Cretæ preparatæ, gr. liij;
Saponis viridi,
Adipis, ää ℥ss.

In all cases free elimination should be encouraged by salines and other laxatives, with abundant water-drinking and perhaps other diuretics. Cotton, linen, or silk should be worn next to the skin. The diet should be simple and non-irritating, and as a rule tobacco and alcohol should be interdicted.

In the generalized variety known as senile pruritus a large number of the measures may have to be resorted to, for the reason that these cases are often intractable, and may be absolutely incurable. In a private communication Dr. F. H. Montgomery recommends in these cases general massage once or twice weekly with a bland oil or lanolin to promote general nutrition, the rubbing being done in the direction of the return venous flow. Other cases of generalized pruritus are amenable to treatment by making sufficient search for and removal of the cause, combined with the measures outlined above.

THERAPEUTIC APPLICATIONS OF LUMBAR PUNCTURE.

In an interesting article in the *Edinburgh Medical Journal* for May, 1906, STEWART reminds us that lumbar puncture was originally introduced by Quincke for the purpose of relieving intracranial pressure in tuberculous meningitis. This it does for the time, though it cannot, of course, be more than a palliative measure. In one case of the writer's, however, the patient, a young man, who was comatose and apparently moribund from tuberculous meningitis, regained consciousness for a day, after the withdrawal of 22 cubic centimeters of cerebrospinal fluid. At the time of puncture the fluid was allowed to flow until the increased intrathecal pressure fell to normal. The importance of this procedure, not only from sentimental but possibly on medicolegal grounds, is obvious.

In intracranial pressure due to other causes, as, for example, in cerebral tumors which are inoperable or inaccessible, lumbar puncture is sometimes of distinct benefit, by diminishing the pressure and thereby relieving headache, vertigo, and other symptoms. Hitherto it has been the custom to trephine the skull as a palliative measure to relieve intracranial pressure and to diminish optic neuritis. But lumbar puncture is quicker, simpler, and less dangerous than a major cranial operation. The writer has performed it in three cases of intracranial tumor in which the symptoms pointed to deep-seated cerebellar disease. In all of them the headache and vertigo were markedly relieved for several weeks after the puncture, and an opportunity was afforded of studying the patient's focal symptoms with a view to removal of the growth. In intracranial growths, however, we must be careful not to withdraw too large a quantity of cerebrospinal fluid, lest sudden diminution of pressure cause a hemorrhage into the tumor (a result, by the way, which sometimes occurs after a palliative trephining). In a case recorded by Masing this actually occurred; but in his case the fluid was allowed to run for a quarter of an hour, and no less than 30 cubic centimeters was withdrawn. The writer has in a single lumbar puncture with the removal of less than 10 cubic centimeters of fluid relieved the condition permanently in several cases of persistent tinnitus and giddiness of

many months' duration. We must, of course, be careful to eliminate all the ordinary causes of tinnitus and giddiness, aural or otherwise, before resorting to this treatment.

In fracture of the base of the skull, coma may be relieved in a remarkably short time by the withdrawal of cerebrospinal fluid. In a patient sustaining a carriage accident a lumbar puncture was followed by rapid improvement. The procedure may be repeated several times on successive days, if necessary.

Cases of uremic coma and convulsions are often relieved in a striking manner by lumbar puncture, and in several instances the patient's life has undoubtedly been saved by this means. For example, McVail records two cases of acute nephritis in which, in spite of energetic treatment by purgatives, hot-air baths, and pilocarpine to induce free perspiration, coma and convulsions supervened. Lumbar puncture was performed; 6 or 8 drachms of cerebrospinal fluid was withdrawn, and within three or four hours the coma passed off, the convulsions ceased, and both patients ultimately recovered completely. Cases such as these raise the question as to whether the headache, coma, and convulsions in nephritis are really caused entirely by "uremic poisoning" of the brain centers, or whether they may not be due largely to a sudden increase of intracranial pressure—part of the general edema.

Again, in cases of tetanus we know that the tetanus poison has a selective action on the motor nerve cells of the spinal cord and brain. And therefore, in addition to removing the tetanus bacilli at the site of inoculation, by excision of the original wound, we endeavor also to neutralize the toxin by means of antitoxin. This is sometimes administered hypodermically. But it is much more efficacious, as Roux and others have shown, if injected into the cranial cavity through a small trephine opening; and some remarkable recoveries have followed this method of treatment. But the procedure is not free from danger. In one case at least the patient died of cerebral abscess at the site of the trephine opening eight weeks afterward, long after all symptoms of tetanus had disappeared. It is easier and better to administer the antitoxin, with perhaps the addition of beta-eucaine and morphine, by means of a lumbar puncture needle.

Strychnine poisoning is also successfully treated by intraspinal administration of eucaine. It may be necessary to give a general anesthetic before the first intraspinal puncture to relax the opisthotonos.

Within the last few years injection of cocaine or of eucaine by lumbar puncture has been a somewhat popular procedure among surgeons, particularly in France, to induce spinal anesthesia for the purpose of doing operations on the lower limbs or the lower part of the trunk. The patient in these cases remains conscious throughout the major operation. Such a procedure, however, should be reserved for very special cases, since, from the patient's point of view, complete unconsciousness is preferable whilst an operation is being performed on his anesthetic legs. Moreover, there is a risk of the cocaine ascending too high to the medulla, and paralyzing the vital centers there. This has actually occurred in some cases.

RECIPES FOR DIABETES MELLITUS.

In the *Medical Chronicle* for May, 1906, WILLIAMSON suggests the following recipes for diabetes:

Cocoanut cakes. One ounce of German yeast; 4 tablespoonfuls of lukewarm water; 16 ounces of desiccated cocoanut powder. Mix into a paste, adding a little more lukewarm water if necessary. Leave in a warm place for thirty minutes. Then add two eggs (beaten up in 3 or 4 tablespoonfuls of milk) and a little salt. Mix well. Place into 16 small dishes or tins (well greased). Bake in a moderate oven twenty or thirty minutes. (Almond cakes may be made in a similar manner, using almond flour in place of cocoanut powder.)

Cocoanut pudding can be prepared in the following manner: Half an ounce of German yeast is well mixed in lukewarm water with a quarter of a pound of desiccated cocoanut powder. The mixture is kept in a warm place for thirty minutes. Then half an ounce of butter, a pinch of salt, and a little milk are added. All must be well mixed. The mixture is placed in a pudding-dish and baked in a moderate oven for twenty or thirty minutes, until the surface is brown. This pudding can

be eaten warm or cold. It may be taken with custard, and sweetened, if desired, with saccharin.

The sugar is practically all removed from the pudding by the action of the yeast.

The cakes are useful as bread substitutes. Many patients like them very much, but others strongly object to the taste of cocoanut in any form. Cocoanut pudding is a useful substitute for rice pudding.

CÆSARIAN SECTION IN THE TREATMENT OF PLACENTA PREVIA.

BRIGGS reaches the following conclusions in the *Journal of the American Medical Association* of May 12, 1906:

1. Every pregnant woman should be examined during the sixth month to determine the presence or absence, and, if present, the degree, of placenta previa. The examination should be made bimanually both by vagina and by rectum, and stethoscopically by the vagina and by the abdomen.

2. In case of central previa, elective Cæsarian section of the Sänger type should be done at the moment of greatest viability of fetus compatible with least danger to the mother.

3. In case the fetus is dead and labor does not set in spontaneously, it should be induced after placental circulation is shut off.

4. In emergency cases, when the patient is not exsanguinated and a sufficiently experienced operator is at hand, the Sänger-Cæsarian section with presumably clean or superficially infected uterus should be done, and the Porro-Cæsarian operation if the uterus be positively and deeply infected. (*A*) In case of total placenta previa with (1) undilated and undilatable cervix; (2) cancerous or fibroid cervix, pelvic tumors, pelvic contraction, or other obstacle to the usual obstetric procedure; (3) ruptured sac with escape of amniotic fluid, and presenting but undescended head. (*B*) In cases of lateral placenta previa with living child, uncontrollable bleeding, and either (1) undilatable cervix or other obstacle to the indicated obstetric procedure, or (2) ruptured and emptied sac with presenting but undescended head.

5. In elective cases complete and thorough preparation should be made, and the operation systematically planned; distinct functions should be assigned to each assistant.

6. In imperative emergency cases the surgeon must operate with what may be at hand—scissors, hemostats, needles, thread, antiseptics, ether.

7. Hemorrhage may be prevented by giving a full dose of ergot hypodermically ten minutes before beginning the operation, compressing the abdominal aorta as soon as the child is delivered, grasping the neck of the uterus low down with both hands and firmly compressing the uterine arteries, and by faradic stimulation of the uterine muscle.

8. Shock may be obviated and relieved by preventing hemorrhage; by rapid operation; by introducing physiologic salt solution into the colon, connective tissue, blood-vessels, and abdomen; by hypodermic or intravenous injection of adrenalin chloride solution; and by compressing the abdominal aorta.

9. In the after-treatment purgation should be avoided; colon injections of saline solution, from eight to sixteen ounces, may be given at intervals of from three to eight hours; the bowels may be moved by enemata; Epsom salts, two to four ounces; glycerin, three to six ounces; asafetida mixture, fifteen to thirty ounces.

10. On the first evidence of uterine infection prompt and energetic measures of local disinfection should be instituted by means of antiseptic exosmosis and drainage.

TREATMENT OF DISEASE OF THE NASAL ACCESSORY SINUSES.

MAYER in the *Journal of the American Medical Association* of May 19, 1906, states in an article on this subject that the question which arises in all cases is whether this is a case for operation or local treatment, and if the former, how extensive shall it be?

A recent writer, lauding the galvanocautery, considers needle puncture to be all that may be required. He says: "The needle puncture is not suggestive for clinical display, and hence, as the cosmetic condition is secondary, the external operation is quite naturally resorted to in the clinics and elsewhere as the quickest and most spectacular means for immediate results." The same writer concludes that the negro must be of a lower

race than the white man, for the reason that the former is said to have no accessory sinuses. Hence we will not take him seriously.

In acute conditions of the maxillary antrum if the ostium can be found, washing with tepid antiseptic solutions will be of much benefit and may effect a cure. Otherwise a puncture with curved trocar beneath the inferior turbinate into the cavity, together with draining and washing, may be required. In acute ethmoidal or sphenoidal disease the removal of the anterior end of the middle turbinate will permit free drainage. In acute frontal sinus affections it may become necessary to open the sinus from above, connecting with the nose through the infundibulum by a drainage-tube.

In chronic maxillary antrum disease we may open the antrum through the canine fossa, then pack and insert a rubber tube, which may be left as a constant drain. We may enter the antrum through a tooth cavity, or we may break down the nasal wall after opening the canine fossa. This is known as the Caldwell-Luc operation. The opening of the canine fossa must often be permanent, and the annoyance of a constant taste of pus in the mouth and its commingling with the food is very great; but this may be obviated by making the nasal entrance into the antrum so large that the pus empties into the nose and has even better chance of complete cessation.

About one-half of the inferior turbinate is removed, and then, by means of specially devised instruments, the antrum is broken into and the whole wall to the floor of the maxilla is removed. The canine fossa wound is curetted, the edges freshened and allowed to heal. In two severe cases in which the author performed this operation the results were very satisfactory. The wound in the canine fossa closed permanently.

Ethmoidal disease is treated by the removal of the anterior half of the middle turbinate, the cells are curetted, and the septa broken down between them.

The sphenoidal may be reached by the curette after the middle turbinate has been removed.

For the frontal sinus we have the Ogston-Luc method, which consists of opening the sinus from above and breaking through the infundibulum.

By the Kuhnt method the entire bony wall is cut away and the external parts therein are packed.

Killian's operation consists of making an incision below the eyebrow to the end of the nasal bone, separation of the periosteum, breaking down into the sinus from below and then from above, retaining a bridge of bone between for subsequent cosmetic effect. Entrance into the ethmoid cells through the wound becomes easy, and also into the sphenoid.

Coakley operates from above downward, and treats the wound by the open method, as in mastoid operations, with excellent results.

The radical operation as performed by Jansen does all this as to the frontal and ethmoidal. He next enters the maxillary antrum through the canine fossa, through the dependent and posterior ethmoids, and into the sphenoid. Finally the nasal wall is broken into and the nasal mucosa used to line the cavity. This is sometimes done on both sides of the face. This radical procedure, however, the author has never attempted.

THE USE AND ABUSE OF DIGITALIS.

PFAFF states in the *Boston Medical and Surgical Journal* of May 17, 1906, that the therapeutic effects of digitalis which we seek in the practice of medicine are an increase of blood-pressure with an increase of pulse volume, and a decrease in the pulse-rate.

As soon as the pulse-rate becomes increased it is a manifestation that we are getting the dangerous effect of overstimulation. Nevertheless, as with every drug, we may find in some patients deviations from the normal action. The knowledge of these abnormal occurrences will also prevent an abuse of this drug. In some people the vagus nerve does not respond to stimulation by digitalis and we see no reduction in the pulse-rate. The counting of the pulse alone will, therefore, give no light as to whether digitalis acts in such cases. In other instances the decrease in pulse-rate may counterbalance the increased blood-pressure, and the total work of the heart done in the time unit may be less than in ordinary cases. However, in other instances the heart's action may be already toxically influenced, the heart-beats may be

much increased in number, and the pulse waves follow each other so rapidly that they have no time to reach the radial artery. A pulse count alone, if not controlled by auscultation of the heart, may lead to a misconception of the situation, and a new dose of digitalis may bring about paralysis of the circulation, before an increased pulse-rate gives the signal of danger. As the main action of digitalis is to increase the blood-pressure and so better to fill the arterial system, the rational indications for its use are clearly indicated. Digitalis may be used in all cases of abnormally low blood-pressure, and in all such pathological conditions in which some symptoms of the disease may be traced to an incomplete filling or emptying of the circulatory system. In the first place are, of course, to be mentioned all valvular diseases of the heart with failing compensation. To give digitalis in valvular disease of the heart in which compensation is perfectly established by a corresponding hypertrophy of the heart muscle is a gross abuse, but often practiced.

The best results of the action of digitalis are, as a rule, to be seen in mitral and in aortic insufficiency. To get a good effect in aortic valvular diseases the quantity of the drug to be used has to be usually larger than in mitral disease. In mitral stenosis and in recent valvular diseases, the effect of digitalis is generally not so marked. In myocarditis, dilatation of the heart, palpitation, and pericarditis, digitalis may be used, but always with caution and close observation of the patient. Ferriar advised the use of digitalis in palpitation of the heart, if the condition was not caused by dyspepsia or general nervous debility.

Recent experimental research on an isolated heart with irregular beats showed that if blood contained digitalis and was perfused through the coronary artery, the heart was made to beat regularly again, thus proving Ferriar's deduction.

The use of digitalis for diuretic purposes is, of course, only indicated when the lack of diuresis can be traced to circulatory disturbances. Other diseases in which digitalis may be indicated are especially furnished by disturbances in the lungs, hypostatic conditions, emphysema, pneumonia, etc.—all cases in which the symptoms may be traceable to some impairment in the circulation. Knowing the action of digitalis we know its use, and can and must prevent its abuse, lest the patient suffer.

TREATMENT OF THE BITES OF COPPERHEAD SNAKES.

In the *Journal of the American Medical Association* of May 12, 1906, CRUM states that for several years he has averaged about two cases of bites of copperhead snakes a year, and finally hit on a plan of treatment which gives such good results that it may be worth while to communicate it to others.

His earliest experience with the use of caustics locally and whisky and ammonia internally was unsatisfactory in many respects, although he had no deaths. During the past year he treated for two months a fearful ulcer of the finger and hand which was caused by cauterization with caustic potash for snake-bite. The final result was a contracted palm and stiff fingers.

Several years ago Dr. Thomas R. Brown published an account of some experiments with potassium permanganate as an antidote to the venom of snakes of the viper class—*e.g.*, rattlesnakes, copperheads, and vipers. Previously the author had used this drug in a measure, but afterward used it almost entirely, at first hypodermically. Being refused this method of administration on one occasion, he used permanganate solution locally on compresses, and apparently with good effect. Shortly after he hit on the plan he now pursues, which gives results incomparably better than anything he has yet used. His plan is to freeze the area around the bite with ethyl chloride spray, incise through the wound, usually making two parallel incisions of almost an inch in length through the two little wounds made by the fangs. Then he soaks the part for a few minutes in strong permanganate solution and applies dressings wet with this solution. The edge of this dressing is raised up every half-hour or hour and fresh solution poured over the surface. The incisions, which are trifling, usually heal in a day. Certainly, so far as his experience goes, an incision in an area poisoned by snake-bite appears to heal with extraordinary rapidity even in the absence of any effort at asepsis.

This method he has now used successfully in eight cases, and is inclined to attribute some virtue to the freezing by ethyl chloride over and above the mere anesthetic effect. If the patient is seen within one hour after the bite, he is usually all right in two or three hours, with the exception of trifling swelling. The extension of the poison seems to be checked very shortly after this application. Internally the author employs a few doses of strychnine, but occasionally uses whiskey and ammonia as well, perhaps out of respect to local prejudice.

RESISTANCE EXERCISES IN HEART DISEASE.

KINNICUTT writes on this theme in the *Boston Medical and Surgical Journal* of May 11, 1906.

Relative to the administration of the exercises, the author says that to be efficient they must be attended with "little exertion and no fatigue." A certain amount of training of the patient and a careful selection and instruction of the operator are necessary. To secure the proper conditions the patient must be taught not to hold his breath or his body rigid (a common tendency), which involves increased conscious effort, to make the movements slowly and very steadily, and to recognize the degree of resistance advised by the physician. The operator should be light of hand, intelligent, and trained in the observation of ordinary symptoms. The use of too great resistance, sometimes at the demand of the patient, is the most common fault of the operator and the most difficult to correct. At the beginning of treatment the author is in the habit of demonstrating the degree of resistance he wishes employed in the individual case. In so adapting the treatment it is needless to say that the pulse-rate, the blood-pressure, the site of the apex impulse, and the outline of the heart must be noted before and after the first employment of the exercises, and from time to time throughout their use.

He has had convincing proofs in his personal practice of the great benefit to be derived from the use of the resistance exercises alone in many forms of cardiac inadequacy. That discrimination and judicious care are required in their application he has endeavored to show. Schott advises their employment with "self-imposed resistance" as an after-treatment in many cases. It is within the competence of any one who has become thoroughly familiar with the different movements, and involves little risk of injury through overexertion.

PHAGOCYTOSIS AND OPSONINS.

In a discussion of this subject contributed to the *Journal of the American Medical Association* of May 12, 1906, HEKTOEN has this to say concerning the treatment of various local infections by these means. There are various procedures employed, many of them more or less empirically, in the treatment of local infections, all of which serve in some way or other to increase the flow of blood and lymph through the area involved. Here belong hot applications of different kinds, rubefacients and irritants, massage, Bier's method of artificial hyperemia, the exposure to *x*-ray and radium, and also, in a measure at least, the Finsen treatment. Wright has pointed out that the blind empirical use of some of these methods may not always be without danger when the blood possesses only inferior antibacterial power, and that their effectiveness may be increased in various ways, but particularly when the antibacterial power of the blood, as measured by its opsonic index, is higher either as a result of reactions to autoinoculations or to artificial inoculations of the proper bacterial vaccine. By the measurement of the opsonic index, then, valuable information may be obtained to guide in the treatment of local infections. Considering the practical impossibility in many cases of local tuberculosis of removing completely all infected tissue, it certainly would seem more desirable to undertake operation, if considered necessary, at a time when the tuberculo-opsonic index is high rather than when it is low and the general resistance of the patient to the bacilli that remain and may enter the opened lymph spaces consequently relatively reduced. The work of Wright and his followers on the antituberculo-opsonin in the blood of tuberculous patients also offers new points of view for the explanation of the healing of tuberculous peritonitis after laparotomy, long the subject of much discussion.

CÆSARIAN SECTION IN EXTREMIS.

Two cases of Cæsarian section on the moribund have recently been reported in a German contemporary, the main feature of interest being the reporter's opinion on the cause of the death of the safely-delivered fetus in the second case. Professor Lumpe, of Salzburg, operated on January 1 on a woman, aged thirty-four, dying of right hemiplegia about term in her seventh pregnancy. Attacks of headache had set in three months previously, with partial loss of power in the right arm. In December, 1905, the speech began to be affected, the right leg became paralyzed, and at length the left pupil appeared dilated, and coma with Cheyne-Stokes respiration followed. Dr. Lumpe delivered by Cæsarian section a living female child, 7 pounds in weight and 9½ inches in length. It breathed well from the moment of extraction. The mother died six and a half hours after the operation. A coagulum as big as a hen's egg compressed the left cerebral hemisphere. The second case is reported by Dr. Nacke, of Berlin. Bursalla, he notes, saved a child last year by Cæsarian section, although he purposely waited by the patient's bed until she had breathed her last breath. Dr. Nacke did the same in the case of a patient at the end of the thirty-seventh week. She died of mitral obstruction and insufficiency with edema of the lungs. Two minutes later Dr. Nacke, who could still define the fetal heart sounds, performed a Cæsarian section and delivered a living child. Contrary, it would appear, to his own directions, the milder means for encouraging respiration were not employed, but Schultze's method was immediately practiced with great vigor. The child died an hour and a half after delivery. At the necropsy two cutaneous erosions were noted on the integuments of the thorax. The heart and lungs were normal. The peritoneal cavity contained a considerable amount of fluid blood. Under the capsule of the liver was a layer of recent blood, and more blood was found in the right pleural cavity. The lungs were fully expanded, the tissue floating in water.

The experiences of Lumpe and Nacke confirm the modern doctrine that in the case of a moribund woman near term it is right to deliver the child by Cæsarian section immediately after death if possible. The children were born alive in both the above cases; excess of zeal, according to Dr. Nacke, proved fatal to the second.—*British Medical Journal*, May 5, 1906.

THE TECHNIQUE OF INTRAMUSCULAR INJECTIONS FOR SYPHILIS.

GOTTHEIL in the *New York Medical Journal* of June 30, 1906, gives the following advice as to this plan of treatment:

The injection fluid, of course, is a suspension and not a solution. When injection of the soluble compounds was first tried watery menstrua of various kinds were employed. The mercurial salts, however, are very heavy, and no matter how rapid the manipulation, it is impossible to keep them in suspension in such fluids until injected. The addition of glycerin remedied the trouble to some extent; but a small proportion of it did not prevent the rapid settling of the salt, and a larger amount proved too irritating, and had to be abandoned. Recourse was naturally had to oils. The vegetable oils, though absorbable, were subject to decomposition; the lighter petroleum oils are now universally used. The author has found liquid petroleum to be of about the right consistency for the purpose. It is perfectly bland and non-irritant; it is fluid enough to pass readily through the needle, and yet viscid enough to hold the particles of mercurial salt in perfect suspension for a number of minutes, much longer than the time required for injection. It does not decompose, and it can be sterilized by the ordinary methods.

Of the mercurial salts, the author uses only the salicylate, and believes it to be employed by nine-tenths of those who use these injections. Calomel has been its only serious competitor, and it is still used by some syphilographers. It is, however, liable to be irritant from containing minute amounts of corrosive sublimate as an impurity; it is undoubtedly more liable to cause salivation and mercurial intoxication; and the author has found practically that it shows a tendency to form clumps and masses in the suspension that entirely interfere with successful injection. The salicylate is free from all these objections. It is never irritant; it is of all the strong mercurials the least prone to show "by-

effects;" and no matter how long the fluid stands, a vigorous shaking is all that is required to obtain perfect suspension again. It contains about 59 per cent of metallic mercury, and of course only the preparation of some entirely reliable house should be employed.

A 10-per-cent (by weight) suspension of the drug in the menstruum has been found the most convenient proportion to employ. This permits easy regulation of the dosage within the limits required; it forms an emulsion thin enough to flow through the needle; and the amount of injection fluid is small enough to do the least possible amount of injury to the tissues. Each drop contains 0.1 of a grain of the salicylate; ten drops equal one grain of the drug, or half a grain of metallic mercury.

Any hypodermic syringe may be made to answer the purpose; but it is very convenient to have one especially suited to the injections. If the instrument has been used for the ordinary injections of watery fluids it must be perfectly dry in all its parts before the oily suspension is drawn into it. If this is not seen to the inevitable presence of droplets of water will contaminate the injection. If the syringe is to be used for water again it must be thoroughly washed out with ether and dried before doing so.

There are other reasons, however, why the ordinary hypodermic syringe is inconvenient. The maximum amount of suspension injected at one time is ten drops; five to seven drops is usually employed. The caliber of the ordinary hypodermic syringe is too large, and its graduation is entirely too coarse to permit of the accurate and rapid estimation of such amounts. It is advantageous, also, to have the instrument heavy, so that the long needle can be thrust with the greatest rapidity through the skin and into the muscular tissues; a slow, pushing introduction is bound to be painful to the patient. The only part of the syringe that can be readily weighted is the head, and if this is made broad and flat at the same time it permits the filled and prepared syringe to be stood up safe from contamination whilst the skin is being prepared for the puncture.

Of greater importance, however, is the mode of needle attachment. After plunging the needle in, which must of course be done whilst attached to the syringe, it is always necessary to disconnect the two and to watch the suspension-filled lumen of the needle for a number of seconds, say twenty. This obviates the possibility of the occurrence of the only danger incident to the method, the injection of the oily suspension into the venous circulation, and the occurrence of embolism of the lungs. The disconnection should never be omitted. For this manipulation the ordinary threaded point is decidedly inconvenient. It takes longer time, and the inevitable motion of the needle point in the tissues causes pain. Hence, syringe and needles should be fitted with slip joints, permitting of instantaneous connection and removal.

The barrel of the syringe should be of glass, as ought to be the case with all hypodermics, so that the fluid introduced may be seen, and the injection of air bubbles avoided. The graduation may be on the barrel or the piston, but it must be distinct enough to permit of drop dosage at least, and this means a small syringe lumen. The rest of the instrument—piston, caps, and head—should be of metal, to give the necessary weight. And here the writer answers a question and meets an objection that he encounters every day. Ought not a mercurial hypodermic to be made entirely of glass or hard rubber? Yes, undoubtedly, when watery solutions of soluble mercurial salts are employed. No, most emphatically, when oily suspensions of the insoluble salts are injected.

The suspension has absolutely no effect at all upon the metal. The polished metallic parts of a syringe may be kept in suspension for months at a time without even the slightest tarnishing of the bright surface. In fact, it preserves the polished nickel plate, which will tarnish and oxidize in time when exposed to the air, but in the suspension remains as bright as the day that it left the factory. The only object in having the barrel of glass is transparency; metal is the proper material for all the other parts.

The needle must be long enough to reach through the skin and subcutaneous tissues even of stout people, so that the injection fluid can be deposited in the depths of the gluteal muscles. For thin-flanked individuals with but little subcutaneous fat a three-quarter-inch needle

would be long enough; but stout people with thick layers of fat in the subcutis require one over an inch long. The so-called antitoxin size, one and a half inches long, is about right. Where the flanks are well developed it should be plunged in up to the hilt; in thin persons it should be introduced less far. A needle of this size is fairly strong, and its lumen is large enough to permit the suspension to flow freely, and to allow a good, stiff wire to be kept in. It is well to keep a separate needle for each patient under treatment.

As to the site of injection, the author rarely uses any other than the gluteal muscles. Occasionally a hypersensitive patient complains that the slight tension and bruised feeling a day or two after the injection interferes a little with walking or sitting; and he has sometimes then made the next injection in the interscapular muscles. The site is not so good, however, and the patients themselves prefer the gluteal site.

The precise point selected is important. It should be in the center of the gluteal mass, about midway between the intergluteal fold and along the inner third of the region bounded by the intergluteal fold and a perpendicular through the great trochanter on either side. Near the trochanter there is less muscle mass and more dense fibrous tissue, and the pressure discomforts after are greater. The area is extensive enough to permit of three or more injections on each side at varying heights, so that it is six to twelve weeks at least before an injection need be made again at any one place. The punctures are made on alternate sides.

In order to place the injection well in the center of the muscular mass the puncture should be made at right angles to the most prominent part of the gluteotrochanteric fold, and somewhat from within outward in direction. Injecting, as so often is done, at right angles to the plane of the side of the buttock is not desirable; the suspension is deposited too near the bony, fibrous, and nerve structures. The pain and disability that some observers report are undoubtedly mostly due to the selection of an improper site for making the injection.

The writer invariably administers the treatment with the patient standing erect, since the gluteal muscles are best massed in this attitude. Besides this the patient cannot see the manipulations, which is a great element in determining the pain caused by the puncture. It also gives one the advantage, in the rare event of having introduced the point of the needle into a vein, of deciding, without consulting the patient, whether to reinsert the needle in another place or not. He almost invariably reinserts it; but it has happened with an especially nervous patient that he has found it advisable to let him go without the dose rather than subject him to renewed puncture.

The injection site having been selected and prepared as described, it is covered with a pledget of sterile cotton which the patient holds in place. The needle is flamed, the suspension is thoroughly shaken up, the syringe filled, and the needle attached. Air bubbles are expelled, and care is taken that the lumen of the needle is well filled with the fluid. The author has not found, however, that the accidental injection of a minute air bubble does any harm.

The pledget over the injection site is removed, and the whole area is thoroughly and rapidly washed with ether: its refrigerant and anesthetic effect is valuable. The syringe and needle is then plunged very quickly up to the hilt in the gluteal muscles. On the rapidity with which this is done, together with the free use of ether, depends the amount of pain that the puncture will cause. Properly accomplished, it occasions none at all. The writer does not freeze the part, for the reason that that process causes as much pain as the puncture, and believes that it favors the occurrence of indurations.

The syringe is now detached from the needle, and the suspension-filled proximal end of the latter is carefully watched for a few seconds. If the point of the needle happens to be in a vein, the suspension will very slowly begin to well out of it; and if the vessel is a larger one, it will be followed by a drop of blood. The needle must then be withdrawn, and another puncture made, or the injection postponed. The precaution, however, must never be neglected. Oozing of blood after the injection is completed, showing that a vein has been traversed by the needle, does no harm at all.

The implantation being found safe, the syringe is reapplied to the needle and the

desired amount of suspension is injected. This should be done very slowly. The needle is then withdrawn as quickly as it was introduced, and the cutaneous orifice immediately closed with a pledget of cotton. A small piece of sterile zinc oxide plaster is then applied, to remain in place for a day, and the injection is completed.

When everything is prepared for the injection the entire procedure takes about one minute. There is a certain amount of dexterity and rapidity in manipulation that is only attainable, of course, by practice; but a little attention to the details here given will enable any one to perform the manipulation safely and without pain.

ETHYL CHLORIDE AS A GENERAL ANESTHETIC.

The discussion on ethyl chloride as a general anesthetic which has taken place recently in our columns has brought out very clearly both the advantages and the dangers of the drug. The statistics collected by Dr. McCardie prove that ethyl chloride is not so innocuous as previous collections appeared to indicate, and his paper, together with the numerous letters, have shown wherein its dangers lie.

Before referring to these it will be well to place on record the main facts as recorded at the inquest before Dr. Waldo of a death under ethyl chloride last month at Guy's Hospital, which brings up the total number of deaths hitherto mentioned as having occurred under its influence to more than thirty. The case was that of a lady's maid, aged thirty-two, who suffered from hematuria, and had already taken chloroform well during an operation for the relief of that condition, which was found to be due to hydronephrosis. The patient had double mitral disease and bronchopneumonia, and was very nervous. In order to open and plug the wound in the kidney, 5 cubic centimeters of ethyl chloride was sprayed on to a piece of lint placed in the face-piece of a Clover's inhaler. The patient did not struggle. When the corneal reflex had disappeared the inhaler was removed, and the pulse quickly failed. The circulation seems to have stopped before respiration, which continued for a few breaths later. Post mortem it was found that the right lower lobe was solid from confluent bronchopneumonia. The left ventricle was thickened and hypertrophied, and the mitral valve thickened and shortened. The left kidney was hydronephrotic, and surrounded by blood-clot. Death appears to have been due to heart failure. Till recently ethyl chloride has been supposed to be a fairly safe anesthetic in cases of heart and lung disease, and the chief contraindications suggested by one or two writers have been connected with obstructive lesions of the upper air-passages. In this case it would appear that there was no such obstruction.

In a number of the fatalities of which details have been recorded serious heart mischief has been noted—for example, fatty degeneration of the heart, with sclerosis of the coronary arteries, in one case; pericarditis and endocarditis in another; fatty heart in yet another. In one or two cases the heart has been found to be normal. Owing to the non-irritative properties of ethyl chloride there seems to be little objection to its administration in disease of the lungs themselves, although, owing to the tendency to deep respiration and a certain degree of vascular fulness in the earlier stage of anesthesia, the drug is rightly regarded as contraindicated when the upper air-passages are seriously narrowed from within or without, and particularly when there is any laryngitis. In more than one fatal case edema of the larynx has been found post mortem, and this condition rigidly contraindicates ethyl chloride. In close connection with mechanical obstruction in the air-passages must be considered jaw spasm, which is fairly commonly observed, so much so that experience shows that it is advisable before administration to place a mouth-prop or the blades of a gag between the patient's teeth. This jaw spasm, irritative and perhaps protective, may be due apparently to overdosage or too great deprivation of air. In the case related above there does not appear to have been any degree of spasm. Without doubt, and coincidentally with the jaw spasm, glottic spasm may arise and cause such serious obstruction to respiration that it becomes necessary to separate the vocal cords by means of the finger. Respiration commonly appears to fail before circulation, and so long before, indeed, that it is supposed that time will be given the admin-

istrator to recover the patient by artificial respiration before heart failure occurs. However, in the Guy's Hospital case circulation seems undoubtedly to have stopped before the respiration. Death may occur with such startling suddenness that it is difficult to determine which function fails first. Cyanosis is not infrequently seen, and is always to be taken as a sign of great danger, since it has been noted in many of the fatal cases. It usually seems to be associated with jaw spasm, although this is not always so, as appeared in a case of danger recorded by Mr. Fairlie-Clarke in the *British Medical Journal* of March 24, p. 679. In this instance general muscular rigidity appeared later, and a quarter of an hour elapsed before the patient recovered consciousness and was out of danger.

The dangers of ethyl chloride seem formidable, but should not blind us to its undeniable advantages. It seems to be generally agreed by experts that it occupies a distinct place in the armamentarium of the anesthetist and the practitioner, in that it allows him to produce quickly a much longer and deeper "single-dose" anesthesia than nitrous oxide, that it conveniently and safely leads up to ether narcosis, and that it may take the place of nitrous oxide when this is not available, not efficacious, or unsatisfactory. In many cases it is to be preferred to ether or chloroform. Most anesthetists agree, too, that ethyl chloride is less safe than nitrous oxide, and should not, therefore, be used in routine dental work, or in general surgical work where nitrous oxide will suffice. On the other hand, ethyl chloride is an admirable anesthetic for short throat, ear, and eye operations. As to dosage, 2 or 3 cubic centimeters for a child, 3 or 4 cubic centimeters for a woman or weakly man, and 4 or 5 cubic centimeters for a man are enough usually. As knowledge enlarges it appears that serious heart disease, as well as obstruction in the air-passages, contraindicates its use. Experience is already enabling us to define the cases in which ethyl chloride is of advantage. It must be realized that the drug is a powerful one, that danger is startling in the speed of its onset, and that minimal dosage, and not too great deprivation of air when anesthesia is complete, are the patient's safeguards.—*British Medical Journal,* May 5, 1906.

CONSIDERATION AND TREATMENT OF THE ACCIDENTS OF SURGICAL ANESTHESIA, WITH SPECIAL REFERENCE TO PREVALENT DRUG TREATMENT.

In the course of an article upon this subject in the *Boston Medical and Surgical Journal* of June 28, 1906, CASWELL expresses the belief that the treatment of surgical shock and collapse should be very largely by prophylaxis. The anesthetist should give as little anesthetic as possible. In certain brain and abdominal cases the operator and the anesthetist should work together, the depth of the narcosis increasing and diminishing as indicated by the operative manipulations. Small amounts of the anesthetic are needed except in abdominal cases, liver and stomach cases, and certain brain and eye cases. If the operator is unconsciously and unnecessarily handling highly organized parts, especially intestines, the narcosis should be deeper and the operator's attention called to the fact. All are familiar with partial or complete postoperative paralysis of the intestines due to too much handling even with rubber gloves or gauze, and with the difficulty of overcoming this. Fortunately, nose, throat, and ear operators do not have these delicate sensory parts to handle, excepting the larynx, as in bronchoscopy, thus the patient has a very slight amount of anesthetic, and shock in these cases is practically unheard of. The anesthetist should notify the nurse to prevent any unnecessary exposure of the body, to keep up the external heat, but not overdo it. The mental apprehension and fear of the patient should be talked away. A long-continued Trendelenburg position, by throwing the abdominal contents against the diaphragm, mechanically retards the heart, and so should be avoided. In line of preventive measures the "nerve-blocking" procedure of Crile should be used to lessen the shock, when operating on an extremity. As the shock impulses go through the sensory nerves, if these nerves can be blocked the shock impulses may be cut off, so that if then the large nerve trunks are cut down on after anesthesia and are injected with 4 to 10 minims of four-per-cent cocaine, the shock is slight.

Drug treatment: When the shock features decidedly predominate, the author

agrees with Crile and Horsley that no drug is of any use, except possibly adrenalin. Hypodermic stimulants are contraindicated. There can be nothing done which will so augment shock and diminish the chances of recovery for the patient as to give any of the nitrite group (amyl nitrite, nitroglycerin, sodium nitrite), remedies which are often used. They are distinctly vasodilators, and what is needed is high pressure, whereas the dilators give low pressure, the important feature of shock. Probably some cases that would have recovered without treatment have proved fatal on account of such medication.

One may say that strychnine and the other stimulants give inhibition and high pressure through vasoconstriction, but we must remember that in shock there is a paralysis of the vasoconstrictor center, and that this is caused by too frequent stimulation. Strychnine stimulates the center exactly the same as mechanical and chemical causes, and by giving it we try to stimulate a center already exhausted. This is practically sending in the same kind of impulses that produced the shock originally.

Adrenalin is the only drug to be used in this condition. It should be given with saline solution by intravenous infusion. The proportions of adrenalin are 1:1000 solution, one part in 200,000 parts of saline solution. Give it slowly and at 110° to 115° F. The favorable action of adrenalin in shock is due to the fact that it acts chiefly on the muscles and the local nerve apparatus of the vessels, and not on the vasoconstrictor center, which so badly needs rest, thus causing increased blood-pressure. Salt solution when alone, given intravenously under the skin or by rectum, is of little or no benefit in cases of shock as it does not raise the blood-pressure. All other stimulating drugs, as strychnine, are out of the question for the same reason. Digitalis can be ruled out, if for no other reason, for its slowness of action.

In collapse, drugs may be employed with advantage, because the vasomotor center needs and can take stimulation to bring it to its proper condition. Strychnine may be used here. Alcohol is of some value in surgical collapse, but its stimulating effect is due to the chemical irritation which it causes. Why use drugs in collapse when cold water on the face, ammonia fumes, and artificial respiration will do the work as well and quicker? Salt solution is indicated if the collapse is due to loss of blood. When shock and collapse are combined the outlook is unfavorable, but treatment should be along the lines of shock.

Rhythmic traction of the heart, by the hand on the abdomen and pressing against the diaphragm, should be tried in desperate cases.

To sum up, the author thinks that in cases of shock or collapse during operations drugs are used too freely and without a clear understanding of the reasons why they are given.

In etherizing give as little anesthetic as possible. If an emergency arises, find out what it is due to. In collapse due to hemorrhage give saline solution; in shock give no drugs hypodermically, but put adrenalin and salt solution into a vein.

LUMBAR PUNCTURE.

One of the most important additions to our methods of examination as well as of treatment made in recent years is lumbar puncture. To the *Edinburgh Medical Journal* for May, 1906, Dr. J. Purves Stewart has contributed an article on the subject containing several important observations. The centrifuged deposit from normal cerebrospinal fluid under a magnification of 400 diameters should not show an average of more than two or three lymphocytes to the field; sometimes there are no cells of any sort. On the other hand, in certain organic diseases of the central nervous system there may be a great excess of leucocytes—polymorphs or monomorphs. In all cases of acute infection of the meninges there is leucocytosis, in which the leucocytes are mostly polymorphs with some large monomorphs. In subacute and chronic diseases of the meninges—tuberculous diseases of the central nervous system—there is lymphocytosis, an excess of monomorphs, mostly small, sometimes accompanied by a low proportion of the large variety. The following are some examples:

A man suffering from epidemic cerebrospinal meningitis was comatose and apparently moribund. Lumbar puncture showed that the cerebrospinal fluid was under excessive pressure, of turbid appearance, and contained 87.3 polymorphs

to the field. Within many of the leucocytes the meningococcus was seen. The withdrawal of about an ounce of fluid was followed by marked improvement and recovery.

The value of lumbar puncture in deciding the question of operation is shown by the following case: A man suffering from chronic otitis media rapidly developed mental dulness and slight aphasia with some fever. The cerebrospinal fluid was found to be turbid and to contain no fewer than 371 polymorphs to the field. An operation was at once performed, and an inflamed area was exposed in the temporosphenoidal lobe, but no abscess was found. The symptoms rapidly subsided and recovery followed.

In the following case the finding of normal cerebrospinal fluid was of great value in diagnosis: In a child deep-seated pneumonia was ushered in by head symptoms simulating meningitis. There were marked headache, some retraction of the head, and squint. Moreover, another child in the family had died from meningitis. The cerebrospinal fluid showed no excess of cells. A favorable prognosis was therefore given and proved correct.

Lymphocytosis is most marked in general paralysis and tabes dorsalis. In a series of 12 cases of general paralysis the number of lymphocytes to the field ranged from 26 to 481, and averaged 133. In 25 tabetics the number ranged from 36 to 316, and averaged 143. Moreover, not only was lymphocytosis present in every case of these diseases, but it was often well marked when other symptoms were slight. Thus, one patient had no ataxia, and his knee-jerks were present, but the ankle-jerks were lost and the cerebrospinal fluid contained 214 lymphocytes to the field. In an early case of general paralysis there were only slight loss of memory, some fibrillary tremors of the face, and a history of transient aphasia and weakness of the right hand after an attack of unconsciousness (a congestive attack). But there were 481 lymphocytes to the field.

Cytological examination of the cerebrospinal fluid is a valuable means of recognizing tabes dorsalis and general paralysis in their early stages. If there is no excess of leucocytes these diseases can be confidently excluded. Syphilis without nervous lesions of the central nervous system produces little or no excess of lymphocytes in the cerebrospinal fluid. If such is found careful examination for signs of organic disease—Argyll-Robertson pupils, loss of reflexes, and so on—should be made. Even if none are found lymphocytosis is an indication for energetic antispecific treatment to prevent their development.—*Lancet,* June 23, 1906.

THE ACTION OF DIGITALIS, SQUILL, AND STROPHANTHUS UPON THE HEART.

The *British Medical Journal* of June 23, 1906, reminds us that all clinical observers are agreed that the drugs acting upon the heart produce at times inconstant effects. The introduction of the glucosides produced from these drugs, such as digitalin and strophanthin, seemed at first to hold out hopes of accurate dosage and less variability of action. Although favorable reports appear from time to time, it must be admitted that these substances have not as yet commended themselves to the profession at large; and this is probably due to the fact that the glucosides cannot be extracted from the plants in a really pure condition without the loss of a great deal of their power. The quality of the active constituents also varies with the time of year in different plants, and in different parts of the same plant. For these reasons many physicians prefer to use, for instance, the infusion of digitalis, which when freshly prepared contains an active mixture of the effective principles of the plant. Pharmacological researches have also led to the same result, as was the case in those of Kakowski, reported in the *British Medical Journal.* The recent investigations of Haynes, carried out in the Pharmacological Laboratory at Cambridge, and published in the second number of the new *Bio-Chemical Journal,* again point to the desirability of some official standardization of these drugs, such as has been urged many times by physicians and pharmacologists. In the absence as yet of accurate chemical methods, the bio-chemical method, in which the minimum lethal dose of each preparation is ascertained for the frog, is the only one at our disposal. Some such indication of the actual working strength of the preparation used would be of the greatest value. At present much valuable time is frequently lost in tentatively increasing

the dose of the drug, owing to ignorance of its real active strength.

An interesting comparison of the action of digitalis, strophanthus, and squill upon the heart is yielded by Haynes's experiments. He found that for the frog strophanthus is ten times as toxic as either of the other two drugs; a similar result was also obtained upon the heart of the cat. This is not in accordance with the usual opinion, for although some observers have pointed out that strophanthus is a dangerous drug, and it is certainly usually given in smaller doses than digitalis, nevertheless the general impression is that it is less active. A case of cardiac disease, as Haynes mentions in his paper, which is not improving under digitalis, may immediately improve when placed upon strophanthus; but we should think that the opposite was a commoner occurrence, for a failing heart which does not improve under the action of the latter drug will frequently respond at once to the former. The two medicines are not, of course, strictly comparable in their effects, for strophanthus does not constrict the peripheral blood-vessels to the same degree as does digitalis, and is therefore specially to be recommended when the blood-vessels are diseased.

The author recommends a more extended use of squill in heart disease, finding that it acts more quickly and effectively upon the heart of the cat and rabbit than digitalis, while it does not cause any more, if as much, gastrointestinal derangement. In therapeutic doses it brings about a more complete and prolonged systole and diastole than digitalis, and slows the heart-beat to a greater degree. He found, however, that squill produces more vaso-constriction of the coronary arteries than either of the other two drugs. This seems to be an extremely important point, and one which is likely to invalidate the extended use of squill as a cardiac tonic, for any diminution of the blood-supply to the heart itself is without doubt extremely undesirable. In man, also, the gastro-intestinal irritation referred to is usually found to be more marked with squill than with digitalis, and the action upon the heart to be far less permanent. Nevertheless, these experiments show that it is desirable to give squill a careful trial in those cases in which it is necessary to produce rapidly a stimulating effect upon the cardiac muscle.

THE USES OF PESSARIES.

HORROCKS writes on this subject in the *Lancet,* June 23, 1906. He believes that in the fitting of all pessaries it is a golden rule that the forefinger should be able to pass fairly easily between the side frame of the pessary and the vaginal wall at any part. If not it is too wide, and if it can be passed too easily it is too narrow. Faults in length are estimated usually by the amount of projection of the lower end, which ought always to be within the vagina posterior to the place of the pelvic outlet. In cases in which the anterior vaginal wall descends with greater force than usual and drives an otherwise well-fitting instrument too low down so that it slips under the pubic arch, it may be necessary to curve the lower end more forward, and sometimes to have the lower end made of much thicker material, and in the worst cases the patient may require to wear a perineal pad as well. Indeed, in many cases it is advisable to tell patients to put on a well-fitting diaper or other perineal and vulval support when they know they are going to do something which will for the time greatly increase the intra-abdominal pressure; for example, if they are about to do some heavy work, or play tennis, or golf, or go cycling, dancing, hunting on horseback, etc.

Some cases of retroflexion require a very deep upper curve, and occasionally either no lower curve or with the lower end curved forward. In the last-mentioned case the instrument is crescentic in shape, and such a pessary is especially useful where there is some prolapse on bearing down of the anterior vaginal wall and bladder as well as the retroflexion. It may be necessary to have such a pessary made with a very thick lower end in order to make it comfortable to the patient. Without altering the curves or the thickness transverse bars may be placed at the lower end, thus supporting the anterior vaginal wall. The author reminds his readers that a Hodge's pessary acts as a lever of the first kind, the fulcrum being in the middle, the power at one end, and the weight at the other. No part of the uterus should touch the pessary. During strain the anterior lower bar is forced down more powerfully than the upper convex end which lies in the posterior fornix, and hence this upper end moves

upward, the pessary turning a little on an imaginary axis running transversely. So long as this upward force is sufficient to prevent the uterus retroverting so as to get the fundus behind the vertical line the instrument keeps the womb in good position. Sometimes a ring acts as a lever, and is more easily tolerated than a Hodge's pessary.

One of the difficulties met with in treating a retroflexion of the uterus is when it is complicated with prolapse of one or both ovaries. Sometimes restoration of the uterus lifts the ovary or ovaries sufficiently out of the way, or they can be pushed out upward with the finger, and in some cases, although no difference is made, yet the patient is quite comfortable. At times, however, the pain caused by the pressure of the upper end of the pessary on the prolapsed ovary cannot be tolerated. This can sometimes be remedied by having the convex upper end made straight or even concave, or one-sided—that is, one side higher than the other. In other cases it is necessary to resort to a soft rubber ring, which does not always remedy the retroflexion and retroversion, but may keep the uterus up at such a height as to relieve symptoms. In a few cases, however, no instrument can be tolerated, and it may be necessary to discuss operative treatment. In some cases it will be found that although the uterus remains more or less retroflexed, the back of the body or fundus uteri is resting against the top of the pessary or to one side of it, yet the patient is quite comfortable. If a patient becomes pregnant whilst wearing a ring or a Hodge's pessary, it should be removed at the end of the fourth month of gestation, for by that time the uterus is so large that it cannot be driven into retroflexion, and so there is no need for the support. Cutter's pessary is effective, but has the drawback of an external band. Yet if the ordinary Hodge's pessary fails to keep up the uterus which has been retroflexed, it is worth while trying Cutter's instrument.

Prolapses of the vaginal walls are very common, and they are associated as a rule with uterine displacement. They can be treated with ring or red rubber cup-and-stem, Hodge's, or cradle pessaries. Hodge's, with specially thick ends or with an upward curve of the lower end or with transverse bars, are useful. Pessaries with a lower end something like the prow of a gondola are at times efficacious. One's ingenuity will often be taxed to find a pessary which is both comfortable and efficient.

Most authorities are agreed that the natural position of the uterus is a state of anteversion with slight anteflexion. Where the anteversion is excessive, and particularly when it is combined with enlargement of the uterus, as in subinvolution, and with some prolapse, it may cause symptoms which can in most instances be relieved by some form of pessary, of which the best, in the author's opinion, is Galabin's cradle pessary. But a ring pessary is often quite successful in relieving symptoms.

Excessive anteflexion is, as a rule, congenital and requires no treatment for itself. It is often associated with, though not necessarily the cause of, dysmenorrhea and sterility, but the condition is not one that is best treated by pessaries. Indeed, no form of pessary is likely to remedy the defect except an intrauterine stem pessary, and this is so objectionable from many points of view that it is nowadays used by very few, if any. Moreover, when the stem pessary is removed the uterus is apt to return gradually to its former condition.

Lateroflexion and lateroversion when coexisting with retroversion and retroflexion can generally be remedied by the same means as are adopted for the latter. If they are pure lateroflexions and lateroversions they are usually associated with some conditions such as parametritis and perimetritis or some pelvic tumor, and they should not be treated by pessaries.

THE VALUE OF TIME AND NATURAL UTERINE EFFORTS IN PARTURITION.

In the *Physician and Surgeon* for May, 1906, COLLINS writes under this wise title. He asserts that it requires time to bring about a proper condition of the cervix and lower segment of the uterus for the safe delivery of the presenting part. This is a variable time, and when there are no urgent contraindications this time should be given—be it three hours or three days. The experience and observation of the author forces him to conclude that this is

very often forgotten at the bedside, with lamentable consequences to patients. The forceps are applied altogether too frequently and altogether too early in a great number of cases. When employed they are not used with sufficient deliberation, and results are brought about in minutes which, in order to properly protect the tissues, should take much longer time. The strain upon the parts is too continuous to properly protect the child or the maternal tissues. The strain should be interrupted instead of continuous. The interval of strain should not exceed one-half minute without a relaxation. More time than is usually given is imperatively required if we are to relax instead of tear the tissues. We should not forget that we are pulling upon delicate structures which must oppose our strength with theirs, pound for pound. We should not forget that before time for relaxation has been given a force of fifty pounds will do more damage and accomplish less than a ten-pound pull with proper relaxation. We need to fix in our mind the time for the various stages of normal labor and conform as nearly as conditions will permit to these periods, not forgetting that more time in individual cases may be given when there are no plain contraindications. We should watch the progress of natural labor with more of a readiness to assist natural processes than with an idea of taking the job entirely into our own hands. The author quotes the indications for the use of forceps from the "American Text-Book of Obstetrics:"

1. Indicated in lingering labor when the natural efforts are unable to effect delivery.

2. When speedy delivery is imperative in the interest of the mother; as in hemorrhage, exhaustion, convulsions, advanced cardiac or pulmonary diseases, etc.

3. When speedy delivery is indicated in the interests of the child, as in impending death of the mother or threatened asphyxia of the child.

And again, a quotation from Dr. John W. Clark in his "Résumé of Prolapsus," published in the June (1905) number of "Progressive Medicine," expresses the facts of this subject:

1. Never encourage a patient in labor to bear down until nature excites this inclination.

2. The use by the patient of tractors to increase the voluntary expulsion effort is questionable.

3. Never apply forceps without a complete dilatation of the cervix. When a more precipitate delivery is necessary it is best to incise the cervix.

Never use forceps without a positive indication. Secure the gradual passage of the head through the vagina and over the perineum. The prevalent use of artificial force, the habitual use of the forceps without any prime indication for their use, the rapidity with which labor is consummated by these artificial means, with the train of evils that follow this departure from natural physiological law, are what the author emphasizes.

Because a patient or her friends insist that something be done is no valid indication for harmful practice. It is our duty to protect our patient's health and happiness. Reputation, pleasing friends, making a brilliant display of our activity, the saving of valuable time for rest or profit, are none of them valid excuses for unnecessarily hastening this process to the ultimate detriment of those who rely upon our skill, our knowledge, and our candor in this hour of woman's greatest pain and peril.

DEEPLY SEATED HEMORRHOIDS CAUSING BLOOD IN THE STOOLS.

GOLDMANN (*Centralblatt für Chirurgie,* No. 26, 1906) reports the case of a man who had suffered from repeated bleedings from the bowel for five years, for which he had been treated to no purpose. He was extremely anemic, and blood was found intimately mingled with his stools. The anus was entirely normal, but by means of a rectal proctoscope there was found four inches from the anal opening and on the anterior wall of the ampulla a mass of dilated veins presenting much the appearance of a polyp. This was surrounded by a catarrhal area. Cauterization through the proctoscope accomplished immediate cure. The characteristic feature of the bleeding from high seated hemorrhoids is the fact that it is moderate but constantly recurring, therefore produces a profoundly anemic condition. The blood is so intimately mixed with the stools that it is not recognized as blood. Schreiber has found varicosities

eight inches from the anus, and notes that in 10 per cent of his cases examined by the protoscope there is some venous dilatation, this often happening in the absence of the common external and internal hemorrhoids.

The treatment of this condition is comparatively simple, since the galvanocautery can readily be applied through the proctoscopic tube.

The findings of Schreiber suggest the advisability of a careful rectal examination and an analysis of the stools for occult blood in cases of anemia which are not readily accounted for.

SURGICAL TREATMENT OF HEPATIC CIRRHOSIS.

CUMSTON (*American Journal of the Medical Sciences,* July, 1906) holds that infection of the biliary tract is a common cause of cirrhosis, particularly of that form called hypertrophic biliary cirrhosis. Considering operative indications he classes cases as hypertrophic cirrhosis with icterus, hypertrophic cirrhosis without icterus, and vascular cirrhoses.

In hypertrophic cirrhosis with icterus surgical interference is indicated because medical treatment is futile, and under it the prognosis is bad, while surgical interference is benign and has been followed by most admirable results. This interference consists in drainage of the gall-bladder. Cumston's incision is carried from the rib border along the external border of the right rectus—*i.e.*, sufficiently large to allow the introduction of the hand. The gall-bladder is packed around with gauze sponges, incised, and after the bile has escaped is explored with the finger. A biliary fistula is formed by the insertion of a series of sutures around the borders of the incision, including only the muscular layers and the peritoneum. The loops of these incisions are brought together but not interlocked. A running suture then closes the peritoneum above the gall-bladder; then the two ends of each suture are passed through the neighboring parietal peritoneum. When this is done the peritoneum below the gall-bladder is closed with running suture, whereupon nothing more remains than to tie each suture in the gall-bladder separately. The top of the gall-bladder which has thus been sutured to the parietal peritoneum projects into the wound, but this projection need not be greater than that necessary to protrude through the rectus muscle.

A buttonhole is made parallel to the fibers of the rectus at about 5 to 6 millimeters from its external border, and through this muscular buttonhole the fundus of the gall-bladder is pulled with a pair of forceps, and then the borders of the opening are united to the anterior aponeurosis of the muscle by interrupted sutures. A drainage-tube which exactly fits the opening of the fundus or of the gall-bladder is then introduced. The fistula is allowed to close in about two weeks.

ON CERTAIN INJURIES COMMONLY ASSOCIATED WITH DISPLACEMENTS OF THE HUMERUS.

JONES (*British Med. Journal,* June 16, 1906) finds that the commonest complication of fracture of the upper end of the humerus is dislocation of the shoulder. In his own experience he can count up more than 26 cases. The usual fracture which is thus complicated is of the surgical neck, the patients being usually between forty and fifty years of age. Injury is commonly from direct fall upon the shoulder. The head of the bone may take any position in rotation, or the fragments may be entirely reversed. The deltoid is flattened, and if there is much hemorrhage in the axilla the arm is flexed and slightly abducted. The characteristic symptoms are the absence of the head from the socket and its independence from its shaft. Swelling and pain are unusually severe. Mobility of the shoulder is much greater than in simple luxation. Fracture of the scapula will be indicated by the easy reduction, crepitation, and immediate return of the deformity on the removal of the lifting force.

Reduction must take place at the earliest possible moment, since at this time the fracture usually fails to unite. Reduction may be impossible. No routine method is of service. Jones's most successful method was by forcible extension of the arm held vertically, associated with hard upward pushing of the fragments.

Of 80 recent cases in which manipulation, gentle and forcible, was tried, only

thirty-six reductions were accomplished, while forty-four failures occurred.

Only two operations need be discussed: one is excision of the head of the bone, and the other McBurney's. Correct apposition of the broken fragments is extremely difficult, but is not needful to obtain a practical result. The serious disabilities are incident not so much to resulting deformity as to the injury inflicted at the time of traumatism.

Jones strongly deprecates the wiring of fractures through the surgical neck. He states that he has seen many hundreds of cases of this fracture, and cannot recall an instance in which he thinks wiring would have been of service. He holds that the operation is one of the most difficult in surgery, and that to his own knowledge it has resulted in disaster in the hands of good men; moreover, the successes are no better than the average obtained by simple and safe procedures. To prevent adhesions massage and passive movements should be systematically practiced between the fourth and eighth weeks.

TORTICOLLIS.

TUBBY (*British Medical Journal,* June 16, 1906) classes wryneck as true and false. Under the head of true wryneck he considers the fixed, occurring in childhood or congenital, the reflex, and the spasmodic and acute form.

The acute form is the ordinary stiff neck. It is really rheumatism involving the sternomastoid, setting up a certain amount of temporary myositis. Sometimes the acute form is the beginning of spasmodic wryneck.

The reflex form of wryneck is undoubtedly due to irritation, which proclaims its effect through the spinal accessory nerve. The usual causes are enlarged glands from carious teeth or other irritation. As a rule it disappears as soon as the cause of spasm is removed. The fixed form of wryneck is due to alterations of the sternomastoid; it is commoner in males, and is sometimes induced by hereditary syphilis. When the fixed form is associated in an infant with a syphilitic history mercury may be given, combined with passive manipulation of the head, with the purpose of stretching the sternomastoid.

The best treatment, as a rule, is the open division of the sternomastoid, together with the contracted cervical fascia. The incision for this should be made close to the anterior margin of the sternoclavicular muscle, and should be about two inches long. The scar never stretches but remains linear, and is concealed in the anterior fold of the sternomastoid. The head must be held in the overcorrected position. Tubby accomplishes this by a piece of what he calls house flannel, so cut as to reach from the forehead over the head, and down the back to the pelvis. This, soaked in plaster of Paris, is bandaged in position. The skin is protected against contact with the plaster by appropriate bandaging. The plaster is kept on for fourteen to twenty-one days, after which the patient may exercise. He should wear a cervical collar for two or three months after operation, so designed that the head is kept in proper position.

The spasmodic form of torticollis is probably due to cephalic lesion, and involves not only the sternomastoid but also often the trapezius. Sometimes the head is jerked violently backward. It sometimes follows severe shock. Section of the spinal accessory and division of the sternomastoid are futile, since the spasm returns in muscles other than those supplied by the spinal accessory. The only operation to be considered is cutting the posterior primary branches of the cervical nerves and removing a portion of them. Both the motor and sensory supply to the back of the neck are thus cut.

False torticollis is that associated with spinal caries, or that which follows cicatrices from burns or wounds in the neck. The head is displaced by reflexly irritated muscles, bony deformity, or pulled over by scar tissue.

PAGET'S DISEASE.

HARTZELL (*Journal of Cutaneous Diseases,* July, 1906) describes two cases of Paget's disease treated by the *x*-ray. The first healed entirely, but this healing was followed by the development of a breast tumor a year after complete cure of the skin lesion. The second case ran an identical course, excepting the mammary carcinoma had not reached the same stage at the time of report. Hartzell from a study of the current literature notes that excel-

lent results seem to follow the use of the *x*-rays in Paget's disease. He personally believes that the careful, systematic and prolonged use of the ray may permanently cure disease of the areola and nipple, but that this agent has very little effect upon the epithelial proliferation in the ducts and in the alveoli of the mammary gland. He notes that the ducts become involved only after some considerable time; that if the *x*-ray is applied early and persistently there is some prospect of a complete and lasting cure. This when the ducts and glands are involved can only be accomplished by surgical operation.

Ravogli regards Paget's disease as a precancerous disease developing as an epithelioma, and gradually involving the deeper layers of the skin.

APPENDICITIS OF CHILDREN.

Broca (*British Journal of Children's Diseases,* June, 1906) calls attention to the fact that appendicitis is almost never seen in new-born babies, the youngest in whom he operated having been one year and eight months old. Even this is most exceptional, partly perhaps because of difficulty in diagnosis. It is to be observed that post-mortems in children under two years of age very rarely describe peritonitis as due to appendicitis. Broca believes that appendicitis in children is predisposed to by mucomembranous enterocolitis. When appendicitis develops as a complication of this condition it comes in a chronic and insidious form. The chronic forms of appendicitis in children are characterized by gastrointestinal atony and dyspepsia. There are attacks of gastralgia, and usually a vague discomfort in the right iliac fossa, where on examination will be felt slight distention, a thickened, non-flexible cecum, and at times a small tumor which is either an enlarged appendix or the associated swollen lymphatic glands. Also there is pain on pressure over McBurney's point.

Broca calls attention to vomiting, especially in the morning, as a sign of chronic appendicitis in children. Attacks of acute indigestion are common; there is vomiting, fever, and the tongue becomes coated. At the same time there is abdominal pain, which is localized either around the navel or in the right iliac fossa, and on palpation there is localized tenderness about McBurney's point. The attacks are often relieved by a dose of oil. They last only one or two days; exceptionally they become so recurrent and violent as to suggest periodic acetonemic vomiting in children.

Broca formulates his practice as follows: The operation should be done immediately if the surgeon sees the case in the first twenty-four hours following the outbreak of the attack. If called afterward he must proceed in accordance with the indications, but with the idea of calming as much as possible the attack before operating. He notes the difficulty in making the diagnosis as against tubercular, gonococcic, and pneumococcic peritonitis. He also calls attention to the fact that worms may sometimes produce symptoms identical with those of beginning appendicitis. He notes that the abdominal stitch of pneumonia may lead to error, especially when this condition is central. The onset of typhoid fever, characterized as it often is by enlargement of the cecum and its lymphatic glands, must be considered. In the presence of a general acute peritonitis Broca advises operation. Encysted peritoneal forms of suppuration, with persistent fever and the presence of demonstrable swelling in the iliac fossa or rectum, call for incision after the third or fourth day. The medical treatment of the acute attack lies in complete deprivation of food, large bags of ice to the abdomen, and the administration of opium only when it is specially required by severe pain not explained by an increase in the iliac swelling. Purgatives are dangerous.

There is a form of gangrenous appendicitis in which Broca admits that the symptoms may be most misleading until the final toxemia, which comes rapidly. There is often little swelling, no pain, there may be absence of rigidity. Broca thinks that in the absence of an absolute and conclusive diagnosis the results of waiting until the patient has either perished or has recovered from his acute attack are better than those incident to the performance of an immediate operation.

Broca removes the appendix about a month after the first attack, and believes that the first attack is sufficient indication for operation. In the case of localized

abscesses he removes the appendix only when this can be done readily. His incision is that advocated by McBurney.

THE LATE RESULTS OF CANCER OPERATION.

STEINER (*Deutsche Zeitschrift für Chirurgie,* Bd. lxxxii, H. 4 and 6, 1906) contributes a statistical study bearing upon the late results of cancer operation, basing his figures on the first surgical clinic of the Royal Hungarian Surgical Clinic in Budapest. The regional study is taken up at some length. In summarizing the results he notes that of 150 cases followed for three years 41 per cent remained free from recurrence; 47 per cent recurred or died of operation (8.66 per cent) or of an intercurrent disease.

Sixty-two cases followed for a period of five years from operation showed approximately 42 per cent of cure, 54 per cent of recurrence, and a little over 3 per cent of operative deaths.

Of cancer operations after recurrence, including 25 cases, 32 per cent remained free for three years, 68 per cent recurred within three years. Of eighteen cases studied in regard to immunity for five years, 39 per cent remained free from recurrence.

The author sums up by the statement that 40 per cent of all cases operated on for the cure of cancer, and which cases he followed for this period, remained free from recurrence for three years, and that 41.25 per cent remained free from recurrence for five years.

THE ETIOLOGY AND TREATMENT OF OBLIQUE INGUINAL HERNIA.

MURRAY (*British Medical Journal,* June 16, 1906) expresses his belief to the effect that the presence of a congenital or preformed sac is the main factor in the causation of inguinal hernia during all periods of life. This belief, based on a number of facts, is strongly suggested by the fact that hernia is most common in the first year of life. In the ordinary inguinal hernia seen in the adult the formation of the sac very closely resembles that of congenital hernia, and those who operate on the hernia of children and infants note that the sac in the vast majority of cases is entirely separate from the tunica vaginalis, and, apart from its delicacy of structure, exactly resembles that found in the ordinary hernia of the adult.

Murray states that he is quite unable to distinguish between the so-called congenital and acquired sac, and that they are both one and the same thing. In one hundred consecutive and in no way selected post-mortem examinations made on persons in whom during life there was no history or evidence of hernia, a potential hernial sac was discovered in twenty-one cases. In most of these the unobliterated portion of the vaginal process of the testis was about one inch long, and the opening at the internal abdominal ring was so narrow as barely to admit a large probe. In three cases the sac contained a small piece of omentum, which was not adherent, and which was readily withdrawn. In seven instances more than one sac was found, and in one case four potential hernial sacs were present, an inguinal and a femoral sac on either side.

Granted the existence of a potential hernial sac, the occurrence largely depends upon two factors—the size of the opening at the internal abdominal ring, and the strength of the muscles guarding it.

The frequency of the appearance of hernia at or about the age of puberty is explained on the basis of increased exercise indulged in at that period. The development of rupture in declining years is attributed to weakness of the muscles, which thus no longer efficiently keep close the inner opening of the peritoneal pouch.

In the infant Murray holds that the essential object of treatment should be to bring about an extreme narrowing, or, better still, the complete obliteration of the funicular process. Providing the protrusion is not large and the hernia can be efficiently kept up by a truss, a cure may be brought about by this agency if the truss be worn continuously for about two years.

Murray does not believe that a funicular process patent at birth can ever be obliterated. Hence the security gained at the expense of a truss is always of a doubtful nature. In competent hands the radical operation can be performed almost without risks, the results are highly satisfactory, and the author's results in sixty cases, varying in age from two months to

five years, lead him strongly to advocate radical operation for the cure of inguinal hernia, especially in children of the laboring classes, since the latter cannot devote that care to the application of a truss which is essential for the attaining of its best results.

Murray believes the third month about the proper time for operation, unless the patient be breast-fed, in which case a truss should not be worn until the eighth month. The operation advised consists in the exposure and excision of the sac after transfixing and tying its neck at the level of the internal abdominal ring. This usually requires that the fibers of the external oblique be split up one-fourth to one-half inch. The wound is closed by overlapping of the flaps.

The author reports two cases of death after operation: one, aged four months, who had been operated on for a right inguinal hernia, died a week later from choleraic diarrhea; the second two days after operation, from a widely patent foramen ovale. There was one case of relapse in an infant four months old, the hernia reappearing within a month. The second operation was followed by cure.

In operating upon the adult the same principles hold good. Murray states that most operations for hernia are too meddlesome and too elaborate. The preference is undoubtedly in the direction of Kocher's method, which consists in the complete obliteration of the sac, which he invaginates and transposes, the pillars of the external abdominal ring being at the same time brought together by several sutures. There is no sewing the internal oblique or conjoined tendon to Poupart's ligament; the inguinal sphincter is left intact.

Murray's procedure, however, in his own cases has been similar to that applied to the infant, and with excellent results. Indeed, he expresses his conviction that the more elaborate methods now in use will be abandoned for some such simple technique. For the large hernias in old persons, particularly such a one as entirely fills the scrotum, which is either irreducible or with the neck so wide as to make the application of a truss futile, a truss or some form of mechanical support must be worn after operation.

Murray has made for these cases a quadrilateral pad of best Para rubber, through which is a large hole for the transmission of the vessels of the cord, and smaller holes to allow the vessels to grow into them and to fix the support. After having opened up the inguinal canal by division of the external oblique, the neck of the sac is sewn or ligatured at the highest possible point. The pad is now placed in position by threading the cord and its vessels into the large hole, there being a slit extending to the margin of the pad which enables this to be opened. The edges of this pad are then placed beneath the external oblique and conjoined tendon on the one side and Poupart's ligament on the other. The cord and pad are then covered with cremaster muscle and the overlapping and divided fibers of the external oblique. The patient is thus provided with an internal truss which Murray hopes will afford efficient support. This procedure has been adopted in five cases, laboring men with huge hernias. In four out of five cases the rubber pad did not cause inconvenience; in the fifth and last case suppuration ensued, and left a sinus so persistent that two months later the pad had to be removed. Murray states that in the next case of inguinal hernia he proposes to use gauze instead of rubber.

COSMETIC SURGERY.

De Vries (*American Journal of Surgery*, July, 1906) classes under this heading the building up of sunken noses, the eradication of frown wrinkles, the setting back of outstanding ears, the removal of marks of dissipation—*e.g.*, bags under the eyes—the raising of heavy jowls, the thinning of thick lips, and many other slighter deformities of the features, without the intervention of the knife. Paraffin is the most helpful material. It must be used in such combination that it can be employed cold. De Vries employs a combination of white vaselin and white wax, with a little glycerin and a little paraffin. This is boiled together and allowed to cool and harden. About five or ten drops of carbolic acid is added to every four ounces of the mixture, to render it aseptic. It is white and of the consistency of butter. A small amount is drawn into a syringe shaped like an antitoxin syringe, but provided with a screw top to force the contents easily through the needle, which is

short. The mixture is scraped off whenever it is to be used, the top of the syringe unscrewed, the mass placed therein, the top replaced, and the plunger screwed down until the mixture begins to extrude in a fine white string from the needle. Any air bubbles must be excluded. The part is made aseptic; the point of the needle is immersed in carbolic acid solution, then in sterile water. Care must be taken not to inject too much. A little is driven in and molded into shape. This makes a permanent correction which is not likely to melt in hot water, since the melting point is much above 110° F.

For the removal of the aquiline nose an incision an inch in length is made over the most prominent part. The skin and periosteum are pushed back and held with small retractors. A small bone forceps similar to the ordinary manicure's nail-clippers is used to crush the hump or to scrape off the excess of bony growth. A file may also be used for this purpose. There is never any suppuration, and the deformity is eradicated entirely, nor are there scar or stitch marks. The sutures should be of very fine silk with a knot placed to one side.

The ears are kept back by denuding at the back of the auricle and the corresponding area of the scalp, and the suture of these two raw surfaces.

Hanging jowls are raised by making an incision in the hairy temporal region, cutting out a diamond-shaped piece at one side of the artery, and suturing with No. 3 silk. The result is perfect.

Bags under the eyes or over are removed with very small and sharp scissors. The incision is semilunar, following closely the edge of the eyelid. It does not matter how ragged the edges are; the result is perfect, and no sign is left of the original incision. No. 1 silk is used to sew. The dressing consists of surgeon's plaster.

Thick lips are remedied by making an incision just beneath the junction of the skin of the lip and the mucous membrane, after which the edges are drawn together. No dressing is required.

A thick nose point is made thin by removing an angular piece of the skin and mucous membrane on either side of the cartilaginous point and bringing the edges together. This both raises and narrows the point.

THE SUFFICIENCY OF SIMPLE INTERCOSTAL INCISION IN ACUTE EMPYEMA.

LEYS (*American Journal of the Medical Sciences,* July, 1906) holds that practically all cases of acute empyema are secondary to bronchopneumonia, and should be treated by immediate drainage as soon as the diagnosis has been made. With very few exceptions this drainage can be made perfectly adequate through a simple incision. Resection of the rib is not only unnecessary but undesirable. Exclusion of air is not needful in the drainage, and irrigation should be avoided. The exclusion of air from the site of the wound is based on the erroneous conception that the expansion of the lung depended entirely upon the maintenance of the pleural vacuum. It is now well known that the lung has a natural tendency to expand, and if its tissues are not diseased it will exercise this vital function of expansion against a normal atmospheric pressure outside, if not forcibly prevented from so doing. Leys holds that air may be allowed to freely enter the incision without interfering in the least with the progress of healing.

VALUE OF LUMBAR PUNCTURE IN THE ACUTE MENINGITIS OF TUBERCULOUS CHILDREN.

SCHLESINGER (*Berl. klin. Woch.,* No. 25, 1906) states that this disease is the most hopeless with which children are afflicted. He finds in literature that but twenty cases have recovered, usually those in which the clinical picture was not complete, since it is well known that all basilar meningitis is not necessarily tuberculous. He reports a case with tuberculous heredity direct from the mother, exhibiting neck rigidity, blindness, and deep somnolence, all of which cleared up within six months.

Schlesinger considers lumbar puncture of great value, mainly because it often allows a diagnosis to be formulated, but also from the therapeutic standpoint, since it at times relieves urgent pressure symptoms, and even though a dry tap result, which is not infrequent in basilar meningitis, the procedure is in itself simple and harmless. The immediate effect of lumbar puncture in relieving headache, delirium, and spasm is often most gratify-

ing, and Schlesinger thinks that when punctures are begun early and repeated judiciously muscular spasms will be either entirely avoided or greatly lessened in severity, this being common enough in the last phase of the disease. This method of procedure is equally efficient against those convulsions which in infants are sometimes the first obvious symptom of an already well-advanced tuberculous meningitis.

TREATMENT OF URETHRAL GONORRHEA BY PASSIVE CONGESTION.

Jacoby (*Berliner klinische Wochenschrift*, No. 26, 1906) has constructed an instrument of about 22 F. caliber, hollow, and guttered at the side. These gutters at the bottom communicate with the central canal of this instrument, which in turn is connected with a rubber bulb in which a partial vacuum is created. This is maintained by a rubber band around the corona. The application should continue for ten minutes. It is employed in subacute and chronic cases, and has, according to Jacoby, a most beneficial effect upon infiltration.

THE TREATMENT OF SCOLIOSIS BY THE KLAPP SYSTEM OF EXERCISE.

Woodward (*Edinburgh Medical Journal*, July, 1906) after calling attention to the frequent failure of the ordinary exercises to correct scoliosis, quotes Klapp's contention to the effect that treatment should have for its end not only a restoration to normal function, but the production of spinal specialists or athletes, for it is only by a high degree of musculature and mobility that any existing deformity can be overcome, or prevented from occurring.

No movements in ordinary use by man are of any great value. It is, however, quite otherwise with the movements of the spinal column when the gait of the quadruped is considered. If a puppy be observed in walking it will be noticed that the spinal column undergoes very marked deviation laterally with every forward movement of a hind limb. It is the lumbar and lower dorsal regions of the spine which are chiefly influenced by four-footed progression. But more than this is required to remove deformity and give scoliotic patients a movable spine. A still wider range of movement calling into play not only the lumbar and lower dorsal regions, but also the upper dorsal and cervical, can be obtained by various modifications of the four-footed gait. If with every step forward the head be inclined to the side where a fore and hind limb are approximated—*i.e.*, to the concave side—an influence will be brought to bear on the cervical and upper dorsal regions which materially increases the degree of curvature of the spine. And further, this lateral curvature of the whole spinal column can be much exaggerated, at each step, by bringing the limbs of the convex side—the widely separated limbs—over to the concave side, the side where hand and knee are approximated. In carrying out this movement the leg of the convex side is made to cross over the other leg. The dorsum of the toes now rests on the ground instead of the knees as before.

Crawling on all fours and the modifications above described allow the greatest possible lateral movements of the spine to take place. The hands and knees are protected while the exercises are being carried out. Suitable gloves may be worn upon the hands, and for the shins and knees a small padded leather trough, provided with straps and buckles, can be easily secured from a saddler. The shoes that are worn should have leather toe-caps to prevent them wearing out quickly, as would otherwise be the case. The clothing is light.

The patient is first taught the correct four-footed gait. Pacing must be carefully avoided—*i.e.*, the progression by bringing the hand and foot of the same side forward at the same time. The child is first taught to crawl in a straight line for a quarter of an hour night and morning. After two weeks this is supplemented by the head being inclined to the concave side as far as possible with each step. After this has been acquired, the patient crawling well, the second modification—*i.e.*, crossing over of the limbs on the concave side—should be practiced. These three separate exercises are persevered in daily for from half an hour up to two hours—one hour in the morning, the other in the afternoon—until four or five weeks have been spent at them.

After this special exercises are ordered to suit the individual need. Thus if there be a case of right convex dorsal scoliosis

the patient is instructed to crawl around and around in a circle, always keeping to the right; the object here being to open out the concavity, and stretch the shortened ligaments and muscles to an even greater extent than before.

Massage and hot air are useful adjuvants to these exercises, the latter being applied to the back for a period of twenty minutes before each lesson.

SUBACUTE OSTEOMYELITIS OF THE VERTEBRAL COLUMN.

DONATI (*Archiv für klinische Chirurgie*, 79 Bd., Heft 4) says that trauma is a very common cause of spinal osteomyelitis. The affection usually occurs before the twenty-fifth year, though it has been seen as late as the fortieth year. A suppurating process, often a furuncle or sore throat, commonly precedes the affection. In girls it is more frequent in the thoracic vertebræ, and in men in the lumbar vertebræ. It develops usually suddenly with general septic symptoms and runs an acute course. Exceptionally it is subacute, with the local symptoms dominant. Complications may lie in the direction of pus burrowing into the surrounding organs, the involvement of the nerve roots, or the direct involvement of the spinal cord itself.

Osteomyelitis of the arches beginning with vague pains usually becomes sharply centered in its symptomatology, tenderness and swelling developing, the latter slowly, the spinal column becoming rigid. These cases usually run a favorable course. Sometimes the onset is extremely acute, ending rapidly in death.

The osteomyelitis of the transverse processes is usually very acute. Two out of six cases died. Pain, tenderness, stiffness, and involvement of the surrounding organs is characteristic of involvement of the pedicles. Complications on the part of the nerves are very frequent—contractures and paralysis of the legs, loss of knee and plantar reflexes, paraplegia with loss of sensibility, Babinski's phenomenon on both sides, girdle pains, retention of urine, have all been noted. In one case of osteomyelitis of the first thoracic vertebra there was palsy of the left arm and leg, with muscular atrophy and paresis of the abdominal muscles.

Osteomyelitis of the bodies of the vertebræ is characterized by symptoms of acute and violent constitutional poisoning, often suggesting typhoid fever or meningitis. Pain is the first symptom, usually very severe and not definitely located. When the inflammation attacks the bodies of the thoracic vertebræ the pain may be located in the chest alone, or in the loins. The vertebræ may or may not be tender to pressure.

The diagnosis of this affection in hyperacute cases may be quite impossible, because localizing symptoms may be altogether wanting. Typhoid, peritonitis, meningitis, have all been diagnosed. In other cases complications developed so rapidly as to obscure the original cause of trouble. Thus pneumonia, pleuritis, and peritonitis have been frequently observed, or acute myelitis may mask the symptoms. There is usually, however, localized tenderness and pain, which is particularly marked on attempts at movements. Moreover, the spinal column is rigid. Local tenderness to pressure is the most important symptom, much more so than pain produced by pressing down upon the head. At times when the cervical vertebræ are involved palpation through the pharynx is serviceable; or when the lumbar vertebræ are attacked the formation of abscess may be detected by abdominal palpation.

The so-called non-suppurative infectious spondylitis always follows an acute infectious disease, is located in the lower part of the spinal column, is indicated by spontaneous pain, and is cured by immobilization. Pain usually radiates to the pelvis, and is made more severe by pressure and movement; there is swelling in the affected region due mainly to the projection of the affected vertebræ, and there may be paralysis of the legs, the bladder, and rectum. There is no tendency to suppuration. The diagnosis is dependent in large part upon the history. Neither the local nor general symptoms are of that rapid progression which occurs in osteomyelitis. Tuberculous spondylitis is distinguished by its slow and chronic course.

The mortality of acute osteomyelitis is calculated at about 46.5 per cent. Hahn gives it as 58 per cent. It is dependent upon an early diagnosis. All operative cases, including those most virulent from the start, give a mortality of 34 per cent; while all non-operative cases terminated in death, with one exception, in which the

abscess opened spontaneously. The mortality of osteomyelitis of the arches is 33 per cent; of the body of the vertebræ 78 per cent. The fatality is greatest when the lumbar vertebræ are involved; it is least when the thoracic vertebræ suffer.

The earlier drainage is instituted the more likely is the patient to recover. The procedure should be an incision, removal of the necrotic parts of the bone, and the opening of the spinal canal when the symptoms indicate that this has been encroached upon either by pressure or by extension of the inflammatory process. When the arches are involved the diseased portions should be resected. When the bodies of the vertebræ suffer curettement must be used. The dura mater requires incision and drainage when it seems distended and does not exhibit normal pulsation.

In the after-treatment of these cases, should several vertebræ be involved, a fixation apparatus may be necessary. Frequently later operations are required for the removal of sequestra.

Correspondence.

LONDON LETTER.

By G. F. Still, M.D., F.R.C.P.

The heat of summer is upon us again, and London is "going out of town" as fast as it can; and for one section of the population the exodus can hardly be too quick; the infants of poor and rich can find safety only in the country and at the seaside at this time of the year. Already the summer epidemic of infantile diarrhea is beginning, and the usual slaughter of the innocents is threatened. Probably, however, most medical men who can compare their experience of infantile diarrhea in London during the past three or four years with their experience ten years ago will agree that the epidemic has been much less murderous in the last few years than formerly. This happy improvement is no doubt due in part to the gradual instillation of some knowledge of hygienic principles into our poorer classes: for instance, even amongst the poorest it is uncommon now to meet with the old-fashioned feeding-bottle with long, bacterium-containing rubber tube, and there are few who do not understand the importance of either pasteurizing or boiling cow's milk; moreover, the use of "municipal milk," supplied sterilized and ready-modified in stoppered feeding-bottles, is doing something not only to prevent infection but also to educate the parents.

Most of our learned societies have long since ceased from their labors, and the most brilliant of "researchers" might knock in vain at Hanover Square or Chandos Street to ask for a hearing until the October session begins. But the closing meetings were not without interest. A most important series of cases was reported at the Neurological Society by Dr. Hinds Howell, showing what curious symptoms may result from the presence of supernumerary ribs in the cervical region. In three cases, pain, weakness, wasting, and some anesthesia in one hand were found to be due to the presence of a cervical rib. The wasting was either in the small muscles of the hand, so that the thenar or hypothenar eminence appeared wasted, or else in the muscles of the forearm. Perhaps the most curious feature of the cases was the gradual onset of symptoms in late childhood or adult life, although obviously the cause of them, namely, the cervical rib, must have been there since birth. In one case the symptoms—pain and weakness in the right hand and arm—began at the age of nineteen years; in another weakness of the thumb with some aching pain began at about thirteen and one-half years old, while in another the symptoms began at the age of thirty-two years. In this last case removal of the cervical rib on the affected side was followed by decided improvement. Two similar cases were recently shown at a meeting at St. Bartholomew's Hospital, and the question of operation was discussed. Dr. Tooth doubted the connection between the cervical ribs and the symptoms; he thought the late appearance of symptoms (in one at eighteen, in the other at forty-three years) was opposed to any causal relation with the extra ribs. Dr. Lewis Jones said that after reading of this connection he had skiagrams taken of twelve cases of hand atrophy which had come under his observation; the *x*-rays showed single or double cervical rib in no less than nine out of the twelve cases.

The Royal Sanitary Institute has recently held a congress at Bristol, and discussed many interesting subjects, amongst which the problem of infantile mortality loomed large under one heading or another, and naturally involved much criticism of our milk supply. One speaker would have goat's milk brought into general use; and indeed there is much to be said for this proposal, if only there were any reason to suppose that the handling of the milk from the udder to the consumer would be any more cleanly than is the present handling of cow's milk. But public opinion is slowly gathering weight on this matter, as is shown by the acceptance during the past month by the London County Council of a scheme for inspecting milk during its transit from country to town, and taking legal proceedings against any purveyor supplying dirty or bacteriologically unsafe milk.

Great efforts are being made in certain quarters to obtain legislation for the prevention of smoking amongst boys, and during the past fortnight some interesting evidence has been taken by the Select Committee of the House of Lords, which is investigating this matter. Prof. Sims Woodhead drew a gloomy picture of the baneful effects of cigarette-smoking; indeed, one can only wonder that there are so many people still left alive in this age of cigarette-smoking, when it damages, according to the professor, the mental powers, the eyesight, the cardiac action, the gastrointestinal tract, and most of the remainder. It was even stated that the physical deterioration of which we have heard *ad nauseam* lately was limited to boys because the other sex has not fallen a victim to cigarettes. Sir William Broadbent added yet a further indictment against the cigarette: smoking, he said, led boys into habits of concealment and deceit; moreover, smoking often led to excessive drinking. He would allow no smoking until after the age of twenty-one. Curiously enough, although this witness admitted that this pernicious habit was doing great harm amongst adults also, no one seems inclined to intervene on behalf of the misguided adult; he still continues to risk his health daily —and, as a rule, he survives. The measures suggested for the suppression of this baneful habit amongst youths ranged from the gentle influence of "moral suasion" to the savage barbarism of the birch. Perhaps the most attractive suggestion was confiscation of the cigarettes from the offending youth by the police. It is obvious that this would entirely overcome any objection on the part of the trade, as the sale of cigarettes to juveniles would no doubt show a most consoling increase, and the only objection which could be raised by the police would be the aggravating regulation which prevents them from smoking whilst on duty, but during their hours of ease they would no doubt have time to enjoy the result of the day's work. Seriously, it is high time that some measures were taken to stop the supply of cigarettes by sweet-shops and automatic machines not only to children of tender years but to the youth in his teens, and some of us may think that example on the part of their elders might do more than precept or punishment in this matter.

Some important lawsuits on points of medical interest have been figuring largely in our newspapers lately. A few months ago a medical man in London was sued for negligence on the ground that he had caused a lady to contract scarlet fever by attending her in her confinement immediately after he had been visiting a patient with scarlet fever. The jury entirely absolved him from blame, and now the husband has appealed against the judgment. Counsel for the appellants tried to prove that "usual precautions" were not sufficient, and that in attending a confinement some special precautions ought to have been taken, but the court dismissed the appeal without even hearing the defense. The extraordinary "Christian science" case, in which a medical man, Mr. Adcock, was prosecuted for neglecting to use proper means in his attendance upon a gentleman suffering from septic poisoning, both doctor and patient being followers of the so-called "Christian science," came to an unsatisfactory ending; the jury were unable to agree, so that unless the prosecution is dropped the case has to be tried again.

Since my last letter well-deserved honor has been conferred on Dr. A. E. Wright, whose work in the latest developments of pathology and serum therapy has won him world-wide fame, and now it seems likely that the opsonic index and the reinstatement of tuberculin treatment

will still further perpetuate the name of Sir Almroth Wright. Amongst the honors conferred in connection with the king's birthday, another which has met with general approval in the profession is the knighthood bestowed upon Prof. A. R. Simpson, the distinguished gynecologist of Edinburgh.

BERLIN LETTER.

By Octave Rozenraad, M.D. (Berlin).

In a few weeks the largest hospital in Europe, the Virchow Krankenhaus, containing 1600 beds, will be opened to the public. In the matter of therapeutics it will have a special department for hydrotherapy, thermotherapy, and so forth. At the head of this department will be Dr. Laqueur, who was formerly assistant at the University Clinic. These methods of "physikalisch-dietätische" therapy have become indispensable to the German physician, and every large hospital is now being provided with them.

The public not only disbelieves in drugs, but the profession has had to suffer so much by patent medicines and by the ever-increasing number of new chemical "Präparate" that the doctor feels more and more inclined to adopt these common-sense methods of the Winternitz school.

At a meeting of the Berliner Medizinische Gesellschaft hydrotherapy in infectious diseases was discussed. Dr. Munter advocated carbonic acid baths. He said that in cases of typhoid fever the carbonic acid bath is of great help. The bubbles of carbonic acid give a certain warmth whenever the cold bath is applied, and thereby the cold is lessened.

These carbonic acid baths are not only given at Nauheim, but the method of giving artificial Nauheim baths is well known everywhere.

Professor Oppenheim reported at the same meeting on the operations for tumors of the medulla cervicalis. A patient suffered from complete paralysis of the arms, of the sphincter muscle, and the musculus iliopsoas. The *x*-rays did not show any signs of a tumor, yet the operation performed by Dr. Borchardt showed a tumor in the medulla cervicalis. Dr. Borchardt thinks that in operating on the cervical medulla there is danger of anesthesia of parts of the head, of decubital ulcer, and of sepsis.

The epidemic of anchylostomum duodenale, by which the western part of Germany, the mining district of Westphalia, suffered very much a few weeks ago, has led to interesting results. The anemic condition is soon followed by an affection of the nervous system, epileptic attacks, paralysis, and cardiac diseases. The warmer the mines were, the more the miners were affected; the best temperature being about 22° C. Sanitary control of the patient and destruction of the feces have arrested the disease.

In the treatment of chronic constipation Dr. Schmidt, of Dresden, wishes to introduce a new theory. He says that chronic constipation is due to a too thorough absorption of the food, which does not allow the growth of microbes in the intestines, which is very essential for the peristaltic movement. Schmidt recommends agar-agar for the treatment of constipation, and says that a daily dose of 20 to 25 grains of agar-agar will remove the complaint. I wish also to mention Dr. Kohnstamm's theory relative to chronic constipation. He thinks that the albumen of the meat causes a toxin which prevents the peristaltic movement, and therefore meat ought to be omitted from the diet, and only eggs, butter, and milk given.

ADRENALIN FOR PAIN.

To the Editor of the Therapeutic Gazette:

Sir: I desire to comment on the report quoted from Dr. Carleton's paper in the July issue of the Therapeutic Gazette on the "Use of Suprarenal Gland in Neuralgia and Neuritis." I was much impressed with the magical results which he seemed to have obtained, and as I happened to have a severe case of supra- and infra-orbital neuralgia under my care, I determined to give the method a trial. I used the quantities employed by Dr. Carleton, and also larger amounts applied by a compress, but unfortunately did not get the desired results. I would be glad to hear from other members of the medical profession who have had experience with this method.

Yours truly,

G. A. Biddle.

Emporia, Kansas.